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No. I.

*A Letter to CHARLES HENRY PARRY, M. D. F. R. S. &c. &c.
on the Influence of Artificial Eruptions, in certain Diseases
incidental to the Human Body, with an Inquiry respecting the
probable advantages to be derived from further Experiments.
By EDWARD JENNER, Esq. M. D. LL. D. &c.*

MY DEAR CHARLES,

IN our conversations formerly, you must recollect my having frequently proposed, as a topic of consideration, what might be the influence of pustular eruptions artificially excited, in many diseases incidental to the human body. Permit me now, without further preamble, to call your attention more particularly to this subject, by laying before you a series of Cases, which have passed under my own eye, and those of others, on whose testimony I could depend. The application I have selected for the purpose is the same, as you are aware, I had used some time before, Emetic Tartar. But though, by references, I find I could go back to the year 1794, yet my experience on this subject was confined within a boundary too narrow to enable me to bring forward facts, for public information, that were sufficiently interesting. You will excuse me if I amplify as I go along, by endeavouring to point out the physiological principles on which the application acts in destroying the roots which give birth to many diseased actions in the animal economy, in a way more manageable than any other at present developed.

CASE I.

Mr. ———, ætat. 60—Was first a seaman, but quitted his profession and settled in a neighbouring town more than twenty years ago. His general health has been good during this series of years, with the exception of occasional interruptions from what is termed sick headach. For the last two or three years his mind was strongly bent on a mechanical pursuit, and his expectations raised high on the result. Disappointment followed, which plunged him into a state of despondency, from the apprehension of poverty, although he possessed the most ample means. From this state of hypochondriasis he became more decidedly insane, and at the expiration of three months, a perfect maniac. The space of time from the accession of the malady to its becoming decided insanity, was about three months. He went through the ordinary routine of treatment in these cases, under a judicious medical gentleman in the same town, who reported to me the outline of the case, and that his bowels were then so torpid as scarcely to feel the effect of the most active cathartics ; for example, he often took latterly, gr. xx. hyd. submur. and the same quantity of pulv. jalap, without any perceptible effect. He had been bled largely from the arm, and local bleedings by leeching and scarification had not been used sparingly. He also took nauseating doses of emetic tartar, but none of his symptoms yielded to this treatment. A physician, whose peculiar province it is to attend patients in this unhappy situation, was now consulted, and a proper person sent from his asylum to superintend the patient. The prospect now became gloomy and alarming in the extreme, and I directed for him, with the view of arousing the peristaltic motion of the bowels, a strong solution of common salt, with a portion of mustard, to be thrown up in the form of clyster, but all our efforts to assist him in this way were unavailing, and it was supposed he must quickly perish. I was again consulted, and in this dilemma proposed to try the result of an application which would produce specific eruptions on the skin. A drachm of tartar emetic was involved in an ounce of simple cerate, and a portion of it was rubbed on the inside of the arms, night and morning, from the elbow joints to the wrist. Papulæ of some magnitude were produced, and a serous fluid began to be visible on their apices about the third day, when amendment became perceptible, and advanced so rapidly that the transition from derangement to health was almost inconceivable. Twelve months have now elapsed, and he has had no symptom of a return of the complaint.

CASE II.

—— C. Esq. ætat. 75,—Had lived freely, and was formerly the subject of carbuncular tumour between the scapulæ; his constitution is feeble from age, and the consequences of his previous habits of life. Some time ago he was seized with a severe attack of cholera morbus, from which he soon recovered, but his intellects became much confused, and his malady continued progressively increasing during the space of several weeks. The remedies usually resorted to were unavailing, when the medical practitioner, acting under my instructions, applied the tartar emetic ointment to the nape of the neck, and between the shoulders avoiding the situation where the carbuncle had formed. The gentleman who communicated the result, states, that soon after the eruptions were produced, the patient rapidly regained that sane state of mind, which, as far as unconnected with age and natural decay of the faculties, he had formerly possessed.

CASE III.

EDWIN DAW, ætat. 17—A tall thin youth. His hair and eyes light, and his complexion fair. I was desired to see him, under the impression, from the account given by his medical attendants, that his case was hopeless, as he was in the last stage of pulmonary consumption; and thus, apparently, I found him. His general hectic aspect, his state of emaciation, his occasional flushed cheek, his manner of breathing, the appearance and quantity of what he expectorated, the anasarca swelling of his legs and thighs, and even the inferior portion of the abdomen, a daily exacerbation of fever, a constantly quick pulse, and a florid tongue, corroborated this report. Superadded to this, it may be necessary to mention for your consideration, that in the course of the preceding fortnight there was a perceptible enlargement about the centre of the left side of the thorax, giving the appearance of a little protusion of two or three of the ribs, but which, on examination, afforded no correct information. It seems he had for some time taken the digitalis and other medicines held in most estimation under similar circumstances. I directed these to be continued, and only recommended the pulv. ipecac. comp. to be joined with the digitalis with the view of soothing the cough. At this period his debility was so much increased that he was confined wholly to his bed, and unable to change his position without the assistance of his father. To engage his mind, and

not with the expectation of his ultimate recovery, the ointment was rubbed on the protuberant part until pustules were produced, which was effected within two or three days. Within a week I thought some amendment was evidently perceptible with regard to the cough and some other distressing symptoms, and the patient thought so too. The application was continued with the view, though somewhat painful in its effects, of keeping the pustules in full activity. At the expiration of a fortnight, perceptible absorption of the anasarcaous effusions had commenced; the general bad symptoms had considerably abated, and his looks were much improved. From this time his convalescence was rapidly accelerated, so that within six weeks no apparent vestige of the disease remained, and he began to renew his ordinary avocation of working with his father as a stone-cutter. As in the protuberance there was a deviation from ordinary consumption, it might be imagined that it was a formation of matter contained in a sac, which had spontaneously burst, and that the recovery might be attributed to salutary changes brought about in consequence; but I never found, during the progress of his recovery, any occurrence to warrant such a supposition. It might indeed have escaped into the cavity of the thorax, but there were no symptoms of any such event. I can hardly conceive this to be a case of tuberculated consumption, though I never saw symptoms which so exactly accorded with the last stage of that disease. He continues free from any indisposition, and follows his employment with great ease, although he is a *little* devoted to ebriety, and, strange to tell you, after his recovery, he made his first grateful sacrifice not to Jove but Bacchus. I have here represented the case as it existed, without wishing it to be inferred, that I deduce from it that the external application of tartar emetic will prove a remedy for tubercular consumption.*

CASE IV.

Mrs. H. of this place, ætat. about 54—Has been the subject of severe attacks of spasmodic asthma. She has used the ointment on the nape of the neck, since which the returns have been more slight, and the intervals between one attack and another more lengthened. The application was not extensive.

* It will appear elsewhere that I have considered the *hydatid* as the source of tubercle, and consequently as giving birth to those tubercles which destroy the lungs in true phthisis pulmonalis. From the vague and unsubstantial opinions lately given by various authors, one would suppose that the luminous work of my friend Doctor Baron on this interesting subject, had never appeared.

CASE V.

Samuel Harris, ætat. 47, Mariner—Was suddenly seized, about the end of January, with inflammation of the right eye. It was not so violent as to prevent the pursuit of his employment for nearly three weeks, when a chill came on daily between three and four o'clock. About half an hour after each attack, a pain seized the right side of the head, principally about the orbit of the eye, extending in the course of the temporal muscle. It continued to return every afternoon at a certain hour, and at length became so violent as to deprive him of sight and intellect. In one of the paroxysms he grew enraged with his wife, because he supposed that she had not lit him a candle, although one was burning before him. These periodical attacks became marked in the end with raving madness. In a paroxysm, with extreme severity of pain, he was at the point of destroying one of his children. He was bled from the arm, leeches, and took purgatives up to drastics, but they took no effect upon the malady. Seeing the impression which tartar emetic had made on affections, connected with a disordered state of the brain and nerves, I did not hesitate to direct the application of the ointment, and it was applied to the left arm. Pimples followed in twenty-four hours, and as soon as they became acuminated, and *contained a little limpid fluid*, the patient found ease; the pain continued to abate, and at the end of *three days it was quite gone*. He continues well. This man, like many others who ply as mariners on our river (the Severn,) was a hard drinker.

CASE VI.

Zeb Selman, ætat. 12.—He had been ill for six months with the symptoms of that disease which is termed chronic hepatitis. His liver felt generally enlarged, very much indurated, and sensible to the touch. He was seen at an advanced period of the complaint by a physician of acknowledged high abilities. This gentleman is reported by the patient's friends to have said, that if he had seen him at the commencement of the disease, the chances would have been *seven to one* against him, and now would be *ten to one*. The cachectic appearance and general emaciation were certainly such as indicated the probability of a fatal termination, and, if I had given an opinion, it would perhaps have been similar. At this period of the progress of the complaint the ointment was applied with the usual cutaneous effect; after which he recovered with astonishing

rapidity, and no vestige of the induration or enlargement within the abdomen remains. Mild aperients, which he had been in the habit of taking, were used during his indisposition.

CASE VII.

John Everett, ætat. 21, with light hair and thin delicate skin. He exerted himself very much in harvest work, and drinking beer after a day of hard employment, was seized with a pain shooting from the diaphragm obliquely upwards to the left side, near to the region of the heart, particularly exasperated by casual motions or jarring of the trunk. He described these pains or spasms by the common phrase of "*stitches in the side.*" Together with these symptoms he had spasm of the œsophagus in swallowing food, which rendered its passage painful and difficult. He also complained of difficulty of respiration, and deep-seated pain in the head. His pulse was quick, and his tongue discoloured. Though every evidence existed of a disordered state of the digestive and respiratory organs, and of the functions of the brain, yet it did not appear that the secretions were much deranged. In this condition his legs became covered with a spontaneous eruption, consisting of large red protuberances, which suppurated and poured forth pus. These have left copper-coloured defœcations as broad as a shilling, principally about the extremities, like some varieties of the eruptions produced by mercury. As he never recollects having taken, or had occasion to take mercury, it cannot be attributed to that cause. These eruptions were accompanied with violent inflammation of the tunica conjunctiva of each eye. Neither venesection nor the application of a blister, which latter acted properly, relieved the symptoms. Antimonials were taken, and the ointment was used with its full effect on the skin, and the antiphlogistic regimen enjoined.— Though a stout young man, he was now totally incapacitated for labour. Bandages were applied to heal the ulcers on the legs, not without attention also to proper surgical treatment in other respects. After this combined plan had been carried into effect, his recovery began to advance, but he remained, for some time after convalescence, so much enfeebled as to be unable to return to his usual avocations.

CASE VIII.

Ann Serjeant, of Kingswood, ætat. 15, (June 25, 1820,)— About ten weeks since was suddenly frightened by a person

speaking sharply to her. Her whole frame became affected with nervous sensations, and in four weeks afterwards a partial hemiplegia seized the left side. In addition to these symptoms she had chorea, affecting certain muscles of the arms and neck, and she had also slight convulsive fits, about fifteen times in twenty-four hours, after which she was accustomed to fall into a stupor, with her eyes fixed. She could hear sounds confusedly, but every thing immediately directed to the ear was perfectly unintelligible. She persevered in the usual medicines for a month or six weeks, without advantage. I then ordered the ointment to be applied, in the line of the cervical vertebræ. I saw her soon after the application was made, and found her evidently amended in every respect. She took occasionally a small dose of jalap and calomel. Her mother now, as the distance was considerable, ceased to bring her, but sent to inform me that she was quite well.

I may observe here, that this girl exhibited a curious illustration of my opinions respecting involuntary, and indeed voluntary, muscular exertions. The right arm was frequently thrown into action during the day. If it was held so forcibly as to restrain involuntary motion, the jugular veins were observed to swell, and she fell to the ground if the arm was not set at liberty. Muscular exertion, which tends to equalize the circulation, may here be involuntarily called into violent action, for distributing a preternatural quantity of blood thrown upon the brain during the paroxysms, and which, if impeded, would be followed by consequences injurious to its structure. This remark admits of extensive illustrations, which would lead me too far from my present path of inquiry, were I to go into them. I would just notice not only those *involuntary* and sudden motions which we designate by the term "fits," whether epileptic, hysteric, or whatever they may be, but also the *voluntary* motions, when the brain has become turgid from any adequate exciting cause, produced under various modifications of vehemence, from the thump on the cushion to the contortions of the orator, as so frequently exemplified within the walls of both houses of parliament. How well do I remember the strong and characteristic action of the late Messrs. Fox, Pitt, Grattan, and a host of public characters.

You may say, my dear Charles, that this case is equivocal; and I am not adverse to admit that inflammatory action, excited in any manner in the line of the spine, *might* have produced the same salutary effect.

CASE IX.

Mr. Fewster's Patient, a young woman.—This was a case of mania. My inquiries were particularly directed to the probable circumstance of its being preceded by hysteria; but the answers negatived the supposition. Her ravings were violent. Leeches were applied about the head, and the ointment upon the leech bites. As soon as vesicles appeared she was well. The directions given for the continuation of the use of the ointment were not attended to, and she soon again became decidedly maniacal. The ointment was soon re-applied with the same cuticular effect, and she completely recovered. Such is the outline furnished by my medical friend Mr. T. Fewster, of Thornbury, a gentleman of long and extensive experience in his profession.

CASE X.*

Elizabeth B. æt. 23 years,—Was delivered of her first child Nov. 25, 1820. She has been occasionally subject to hysteria. The second day after parturition she became suddenly deranged, and totally unmanageable, obstinately refusing to take food or medicine. The ointment of tartarized antimony was then rubbed along the inner surface of the fore-arm, from the joint to the wrist; but a fortnight had nearly elapsed before a vesiculated eruption was brought out.† This, I presume, might be in some degree assignable to the attendants, who were irregular in applying it. As soon as the eruptions appeared, amelioration of her symptoms was evident; she was kept under the influence of the ointment nearly three weeks, during which time she progressively improved. About ten days after the appearance of the primary eruptions on her arms, similar pustules appeared on her back. I saw her this day (Jan. 6, 1821); she appeared perfectly well. The eruptive action had subsided. During the use of the external application she took an occasional purgative, and she had also a solution of the antim. tart. to take internally in nauseating doses, but her friends found so much difficulty in getting her to swallow any

* These two Cases, X. and XI. were communicated by Mr. Fry, Surgeon, a gentleman in extensive practice at Dursley, in whose integrity, from long intimacy, I can always confide.

† This torpor of the skin is not unusual in cases of this description; I have met with it many times in my practice. I once put setons into the temples of a lady who had hysteria, with occasional aberrations of mind: at the end of ten days, no inflammation, swelling, or discharge, had commenced. The same circumstance has, however, been noticed by others:

thing, that I believe it to have been so far relinquished, that her restoration may be chiefly imputed to the ointment. It may be right to observe, in elucidation of this individual's complaint, that she is an unmarried woman, and in consequence of seduction, with rather a delicate mind, she suffered great mental anxiety during the latter part of her pregnancy.

CASE XI.

Charlotte Halloway, ætat. 20,—During the last two years has been occasionally subject to great dejection of mind, which generally lasted for a week or ten days at each recurrence.—This depression was almost invariably succeeded by an unnatural excitation of spirits, but never by incoherent expressions or actions. About the middle of November 1820, without any seeming immediate cause, she became suddenly and completely insane. The antimonial ointment was rubbed upon the inside of her fore-arms, and at the end of four days, the usual eruption appeared, and she *immediately* became much better. The application of the ointment was then neglected, the eruptions began to die away, and she had a recurrence of insanity, but not so violently as on the first attack. Recourse was again had to the ointment, and a fresh crop of eruptions was produced within the space of four days. She then gradually got well, and has continued so to the present moment (Jan. 5th, 1821).—Her own statement to this effect is confirmed by her mother, who says, that she is in better health than she has been for the last two years. The original vesicles are now exsiccated, but the scabs have not separated; some are yet scattered over her body.

Feb. 16th. She has again relapsed. The ointment had succeeded in the previous relapses, and the influence was such, after a crop of pustules had been produced, that if kept up she would probably have completely recovered, but the parents relinquished it with a singular indifference, and have since been endeavouring to get her into St. Luke's Hospital.

CASE XII.

Mr. R * * *, a young man in trade, connected with the shipping.—Hypochondriasis.—He complains of an affection of the head, of twelve months standing; and had it not been for the assistance of a partner he would have been incapacitated for following his ordinary employments. He occasionally loses his reason, but his aberrations are not of long duration, vary-

ing from twelve hours to two days ; at best, however, he is seldom quite free from mental alienation. His countenance is pallid, bowels irregular, urine high coloured, flatulent, with heart-burn, and quick pulse. He was last under the care of a physician of eminence at Bristol, who appears to have treated him judiciously. He is directed to take the pil. hydrarg. and aloes, with a dose of magnesia and creta twice a day. At the same time he is to use the ung. antim. tart. on the pit of the stomach.

Feb. 10, 1821. Mr. R. is better in every respect. The vesications from the action of the tartar emetic are both numerous and perfect ; and I think that the abatement in the cerebral symptoms has been commensurate with their formation and progress. He describes his general sensations as having been considerably relieved, or, as he expressed it, "much pleasanter," after the appearance of the eruptions. It is right to observe, that I thought fit at the same time to continue medicines which he had taken habitually to keep up the secretions of the abdominal viscera.

Feb. 15. He continues free from all the previous urgent symptoms of his complaint. He has kept the pustules in action upon the skin, by repeating the applications, and persisted in the use of the magnesia and aperient pills. Some eruptions have made their appearance under the cuticle, upon the palms of the hands, and on the scrotum.* The latter being troublesome, he is directed to use the unguentum zinci as an application.

Feb. 20. He is so much better that he is now almost free from indisposition, and wishes to know whether he may resume his ordinary occupations.

CASE XIII.

Mary Smith, ætat. 21,—In the winter of 1819 was affected with pyrosis. Soon after she had cough with difficult respiration, and pain after swallowing in the region of the stomach. Her food passed off imperfectly digested, and her evacuations were mingled with slimy matter. She has felt pain at different periods of her complaint, shooting in various directions, apparently among the abdominal viscera, particularly under the edges of the ribs on the left side. I have invariably found her pulse very quick, and her heart frequently palpitates. She has had profuse hæmorrhages from the lungs. On the first

* See a coincidence observed by Dr. Robinson, quoted pages *seq.*

seizure, she brought up more than a pint of blood. Venesection was used, but without alleviation. I saw her at the time I received this narrative, and directed for her the oxyd of bismuth, according to the plan brought forward by my friend Dr. Marcett. It produced its usual good effects, though they proved but temporary. Whilst bismuth was used internally, the ointment was rubbed on the inside of one of her arms, near the wrist, and with its usual effect on the skin; yet she had frequent relapses, attributable chiefly, I conceive, to the situation she had been doomed to dwell in, a parish workhouse. However, this being known, her food and lodging were rendered more comfortable, and better adapted to her situation.* The consequence is, a more perfect freedom from the whole train of morbid symptoms which had so long harassed her; and it is worthy of remark, that when any threatening feeling takes place, she almost instinctively has recourse to the application of the ointment, and never (as she declares) without obtaining the relief she seeks for. The case never assumed the character of genuine tubercular consumption, but consisted in chronic inflammation of the mucous membranes of the bronchia and intestines with pyrosis, and cough like the tubercular, which is so frequently concomitant with the latter (pyrosis). The many symptomatic derangements of other viscera which attended this case, and which abound in all similar cases, afford a satisfactory diagnosis between it and *idiopathic* phthisis. We may infer, from the partial influence of the ointment in this instance, how useful an auxiliary it may prove in complicated constitutional cases, where entire success cannot be expected to be a result of its application.† Trials far beyond the limits of my present practice will, however, finally determine this point. It is hard to define what membranes sympathise most with this action of tartar emetic, but it is clear that mucous membranes sympathize very conspicuously.

* It is to be lamented that the opulent in most countries pay so little attention to these abodes of wretchedness. When sickness and poverty unite, no uncommon union here, let those who have felt the *one* (and who has not felt it?) conceive, if they can, the situation of a sufferer, when united with the *other*. See an interesting little work from the philanthropic pen of the Rev. Richard Worthington, M. D. "for bettering the condition of the sick Poor."

† In a patient who has suffered from obstinate general derangement, and atony of the digestive organs, with cough, constant feeble respiration, and disposition to sore throat, the ointment had the singular effect of relieving the cough and respiration, but at the same time of *apparently* reproducing the sore throat, after each application. It is possible this might be coincidence.

June 20, 1821. This patient now is almost free from any symptoms of deranged health.

CASES XIV. XV.

The two following Cases are thus briefly reported by a Medical gentleman in my neighbourhood.

“In the case of Miss A. a young woman, symptoms of hysteria and hypochondriasis have manifested themselves for more than a year past, latterly verging to that extreme in which hysteria glides into insanity. I directed the antimonial ointment to be rubbed on the arm, and I am happy to give testimony to its favourable effects, by saying, that she is decidedly convalescent. Various remedies had been before exhibited, under the direction of several medical gentlemen, but without any constitutional amendment.

“Mrs. G——, from Birmingham, afflicted with despondency, bordering on insanity, has been treated successfully with the ointment principally; and now only labours under slight and occasional symptoms. Being so much better she is gone from hence, and is no longer under my care.”

Feb. 18, 1821.

CASE XVI.

Mr. Frankis, Slimbridge, ætat. 37,—Has been very corpulent, and for some years much disposed to hard drinking, especially ardent spirits, the use of which he is not entirely capable of resisting. He caught cold in consequence of sleeping in an open carriage, exposed to a damp air, and previously drinking cold cider when he was warm. He has had hæmoptoe; and a considerable quantity of blood has been expectorated at several times. His respiration is now very quick and difficult, with cough and expectoration of very inspissated phlegm. His pulse is quick. He has been bled repeatedly during his illness, which has been now of thirteen weeks duration. This, and some medicines which were prescribed for him, have given relief to the chest. Besides occasional aperients, and a mild linctus, the form of medicine now prescribed consists in a combination of pil. scillæ co. and pulv. ipecacuanhæ co. He has, last of all, used the ointment, which has excited a very irritative crop of pustules on the chest. Since they have been fully formed, and have discharged, he has found great relief of respiration, but not so decidedly of the cough.

June 12. A month has elapsed since the former note was taken. He continued the pills until their effect seemed to diminish. The pustules on the chest continue to suppurate. His respiration, cough, and general strength, are greatly improved. He sometimes spits very small quantities of blood in the morning, which has been long his habit. His pulse was never below 100 during his former symptoms; it is now about 80, and strong. He feels on the whole so much better, that he expresses great confidence in his recovery; but this, I own, from his long continued bad habits, is more than I feel myself.

CASE XVII.

Communicated by Mr. Fry.

Mr. William H. about 40 years of age,—For 25 years has been subject to pulmonary affections. He has a very thin delicate skin, and possesses manifestly the true pthisical diathesis. When young, he was subject to a very alarming hæmoptysis, of which he recovered, and has enjoyed an improved state of health, though nothing like exemption from pulmonary disorder. After being severely indisposed with affections of the chest, viz. cough, and impeded respiration; he was seized, last summer, with a dangerous recurrence of the hæmorrhage. It was concluded that he had pulmonary consumption in the last stage, and the case afforded every indication of terminating fatally, but the hæmoptoe, which became more and more violent, was at last arrested by superacetate of lead, and the tart. emet. ointment was applied to the chest. As soon as the eruptions vesiculated, he got better; when they died away, he began again to feel uncomfortable about the chest, complaining that he felt “plugged up in breathing.” He finds immediate ease by a renewal of the eruptions, and has, in consequence, continued under their influence for nearly twelve months past. His skin is so irritable, that pimples almost immediately follow the application, though in some individuals three days will elapse before they will be excited. The ointment gives him most relief when applied to the opposite side of the chest to that most affected.

CASE XVIII.

John Gay, 39 years of age,—Was taken ill about four months ago, with feelings of languor and nervous debility, accompanied with dyspepsia, bilious and acid eructations: he had also

pain in the right hypochondrium, dry sore throat, and general feverishness. With these symptoms he had pyrosis. His complaint continued to grow worse, especially a dull pain which had been going forwards in the region of the liver, till he was seized with symptoms of complete obstruction of the common duct of the gall-bladder. His skin became tinted with a deep blackish yellow colour. The food and medicines which he took, for some time after the symptoms of obstruction, regurgitated in an unaltered state, from the stomach. He found great difficulty in procuring medicines, from different medical men, that would act on his bowels. In this emergence, scanty evacuations of slime were procured by the administration of clysters; but he passed no solid stercoraceous stools; pills of soap and rhubarb, combined with an aromatic, and also the ointment, were now prescribed for him. Pimples appeared within 24 hours. These suppurated, and discharged pus with unusual freedom, and evinced a disposition to continue to discharge. About the time at which the pustules appeared, a sudden burst of evacuation took place, consisting first of bilious coloured fluid, next of slime of a green hue, and an abundance of shreds of a skinny appearance. In his first stools, at this time, my patient observed a mass, which he conceived to be food and medicines which he had taken previously, and had remained unaltered in the alimentary canal. The pain in his right shoulder and right hypochondrium abated rapidly, and his stools came away more solid, but still enveloped in slime. He is now convalescent, but tender under the margins of the right ribs, and possessing a mitigated degree of unhealthy action about the liver. As his health improved, the eruptions evinced a *disposition to dry up*, but they have been continued. He had, four years ago, a constitutional sore, which has occasionally healed and re-appeared: its final suppression may have had some connection with his present complaint. His recovery went on and was perfected in far less time than I could reasonably expect, considering the extreme state of debility to which he was brought by his long and severe sufferings. Within six weeks he resumed his laborious occupation, which was that of a sawyer.

Such, my dear Charles, is a sketch of Cases in which the practice has for the most part been attended with successful results.

These trials of the influence of vesiculo pustular eruptions excited by means of tartarized antimony, have as yet been limited, but I trust the general favourable results of the experi-

ments made, will apologize for my hazarding a few physiological hints for the consideration of those, who may think a wider basis to work upon desirable. In many points I can have nothing to offer, save in the form of speculation, but I hope you will not discard my Letter until you have sufficiently reflected upon what I submit to your consideration, and you will then perceive that I make my stand on my favourite pedestal, analogy.

There was a period at which an inquiry into the effects of the application of tartarized antimony, in some diseases, appears to have been made, and to have excited considerable interest. It is difficult to conjecture the reason of the chasm which took place in the inquiry. At all events it has been vaguely pursued. At the time to which I allude, 1773, two papers appeared in the *Memoirs of the Medical Society of London*, on the external application of tartar emetic; the first had for its object, to deny the possibility of its external absorption;* but the second communication by Dr. Bradley contains some interesting observations on its influence in rheumatic affections, for which it had been previously recommended to the Society.†——

By the tartrite of antimony we can not only create vesicles, but we can do more—we have at our command an application which will at the same time both VESICATE, AND PRODUCE DISEASED ACTION ON THE SKIN ITSELF, BY DEEPLY DERANGING ITS STRUCTURE BENEATH THE SURFACE. This is probably one cause why the sympathetic affection excited by the use of cantharides, and those changes produced by tartar emetic, are very different.

If we enter into minute inquiry, do we not perceive that different natural diseases of the skin have their peculiar sympathies with the constitution, from causes which from analogy admit of imitation by the use of artificial irritants? First, have we not those diseases which take away the cuticle, expose the raw surface of the cutis, and excite a new diseased action on the abraded surface, which then discharges a fluid apparently consisting of little more than serum, next a semipurulent, and, lastly, a discharge nearly purulent? Secondly, diseases or derangements in the cutis itself, which call a train of sympathies into action of a still more extensive and important nature: and, thirdly, the subcutaneous affections of the cellular membrane, which indeed do not admit, strictly speaking, of being directly classed with

* “Observations and experiments on the external Absorption of Emetic Tartar and Arsenic. By William Gaitskell, Surgeon, Rotherhithe.” pp. 79.

† “Observations on the external use of Tartarized Antimony. By Thomas Bradley, M. D. and F. M. S.” pp. 247—252.

the pure diseases of the skin, though the skin becomes indirectly affected, as in boils or carbuncles? Hence then, in all probability, arise their complexity and extensive effects on the constitution.

Some of the most unsightly, obstinate, and widely-spreading cutaneous eruptions produce little or no constitutional irritation, nay, merely simple itching. For what reason? They are attached to the surface of the cutis merely, and do not penetrate into its substance. To the same causes is attributable the comparative mildness or entire want of secondary fever in varioloid affections, and in chicken-pox.

Many observations might be made upon the distinction between the mildness of small-pox in some cases, and its severity in others, which tend to support the above observation. A different degree of secondary fever will follow, when the skin is simply affected on the surface, and when it is partially destroyed beneath. The skin is a very comprehensive term: it may be said to consist of cuticle, cutis vera, rete mucosum, and its partial connection with cellular membrane. In my first work on the Vaccine, I pointed out the different symptomatic and constitutional effects produced by variolous virus, whether inserted in such a way as merely to be lodged within the skin, or to pass through it, and to be lodged upon or within the cellular membrane.*

In order that I may display, in a still stronger point of view, the analogy between the phenomena of artificial and spontaneous eruptions, and the peculiar operations which we may hope to imitate in certain states with successful results, allow me to bring to your recollection, in a few preliminary observations, the rise, progress, and termination of what is called an exanthematous fever. The small-pox will afford a luminous example.

Morbid animal matter, generated by this disease, is applied to the body either by what is termed the natural or artificial mode. After a given space of time, in either case, diseased action is manifested by that constitutional derangement which is designated fever. This goes on for a limited period, when eruptions appear on the skin, which soon show on their apices vesiculated specks. Here the disease, as far as it depended on the *primary action* of the infectious matter which called it into existence, terminates. But now a new train of symptoms comes on, consequent to the diseased action excited on the skin by the

* "Inquiry into the Causes and Effects of the Variolæ Vaccinæ." Third edit. p. 50—53.

pustules, the influence of which is felt in proportion to their numbers, their malignancy, the disposition of the constitution, and the extent to which they penetrate the skin. The fever, in the first and second instances, has two *distinct* origins. In the *first* instance, it arises from the influence of the morbid matter inhaled, or intentionally applied; in the *second*, from diseased action going forward on the skin, and, in many instances, also on the mucous membranes of the fauces, trachea, and ramifications of the bronchia. The rapidity with which, in some instances, the secondary diseased action follows the primary, often obscures the distinction. Of this the ordinary phenomena of confluent small-pox and scarlatina exhibit familiar instances. In the first of these the skin is often so quickly and universally assailed, that there is, in most instances, no interval of cessation. Nature is in a hurry to call out her guards!

Let me here introduce some practical remarks upon the benefits which may be derived from sedative applications, where the pustules are formed so thick upon the cutis as to augment in a high degree the secondary fever. From the rare occurrence of small-pox in this district, I have had no opportunities of making the experiment myself, but on suggesting it to my friend Mr. Fry, he made trial of it in the case of a young woman, when the small-pox made its appearance in the town of Dursley some months since. This patient had a full burthen of distinct small-pox, and her countenance was loaded with pustules. In this state one cheek was sopped with liq. lythargyri somewhat more diluted than I intended, while the other was suffered to take its course for the sake of comparison. The consequence was, that although, from excessive occupation, this process was not repeated by Mr. F. the effect was nevertheless very manifest, for the pustules were so much checked in their progress to maturation, that they could be scarcely said to have matured at all. This practice suggested itself to me in consequence of using lotions which possess a chemical, probably a coagulating influence over the secreted fluid itself, as well as the organic arrangement destined to form the secreting process, in cases in which the irritative inflammation that surrounds the cow-pox pustule has a tendency to ramble too widely. Of this I may cursorily observe, we shall hope to see no more if attention is paid to my instructions lately re-published. The principle, I must repeat, consists in mitigating the secondary commotion in the constitution, by checking the activity of the pustules which excite it. How often have I seen violent febrile irritation in the constitution, arising from carbuncle and

erysipelas, entirely removed by the use of these applications ! In London, some years ago, I suggested repeatedly to the late Dr. Woodville, who had such opportunities at the Small-pox Hospital, and again to his successor Dr. Joseph Adams, in some of those desperate cases in which fatal results must inevitably follow when the disease was left to pursue its own course, to sop the skin, or even to wrap the patients in sheets wetted with liq. plumbi, but without exciting any practical attention. Even should this, or any other mode suggested by the hints thrown out, prove successful, *nature would probably require that we should leave here and there a cluster of pustules, e. g. on a leg or arm, or any other convenient part, to go through their course.* I am aware of the injurious influence of lead, as no one has seen more of it than myself, but, in cases like these, we are warranted in running a risk to avoid destruction OTHERWISE inevitable.

It is a matter of interesting speculation, in what way the sympathy is created between the constitution and the skin, and how the former feels the influence of spontaneous eruptions. Is it not, in all probability, through the medium of the brain and nervous system ? The disposition in the brain to receive unfavourable impressions from ill timed suppressions of cutaneous affections, is a reflex action favourable to my supposition ; and I may again remind you of the ostensible connection of the brain and nerves with the appearances on the skin in the exanthemata. Secretion is an important function, undoubtedly regulated by nervous influence, and by making supernumerary and often temporary secretions, as by extraneous eruptions, may not certain laws of morbid actions, producing results similar to those reasoned on by Mr. Hunter, be the most general purport of their appearance ? May we not, by making new diseases, check the progress of the disease in a vital organ, or in a part where it may be unmanageable, by substituting another which is under our control ?

I conceive that not only the typhus and yellow fever, and other acute diseases unattended with eruptions, rheumatism for example, might be comprised within the sphere of our experimental attempts, but that many other affections may also be included, in which the brain and nerves are primarily disordered. Suspecting also from various coincidences, that dysentery in the first instance is an affection of the brain, and that the visceral derangement is merely consequential (I cannot here go into detail,) I should try the ointment as a remedy if opportunity offered.——

Do not let us forget, that alteration of structure, and diseased

action, are two distinct things, though one may produce the other : but it is with diseased action that we must hope to grapple with success by our present plan. I must here observe, that where a vital part be so deranged that it may be said to have fallen into ruins, little can be expected from this or any other plan of treatment.

With regard to modes of adapting the strength and management of the application to the peculiarities of the case, my knowledge is at present imperfect. The formula which I have used, in the foregoing cases, has been for the most part as follows,—but I sometimes find it necessary to make it more active.

R. Antim. Tartrat. (subtil. pulv.) 3 ij.

Ung. Cetacei, 3 ix.

Sacchari Alb. 3j.*

Hydr. Sulph. Rub. gr. v. M. fiat Unguentum.

The time cannot be precisely fixed in which it will perform its office, as it will in some degree be regulated by the irritability of the skin and the disposition of the constitution. A patient applied the ointment according to the preceding formula, at night, and had eruptions next morning, which was within a space of twelve hours. He had, however, used the same on a preceding occasion in cold weather, and with a skin less perspirable : in this instance it was much tardier in vesicating. Perhaps the application of a cupping-glass, or a sponge dipped in hot water, or even friction, before using the ointment, would be advisable, where the skin indicated torpor ; but the water must be carefully wiped away previous to the application. If its speedy action is required, as in tetanus and hydrophobia, to give it a fair chance it would be advisable that trials should be made on the thin cuticle behind the ears, as well as on other parts.

In the case of a lady, where two parts of the tartar emetic and one of simple cerate were used, eruptions appeared in a few hours.

In this case I used the ointment in a great degree of strength, perhaps its greatest ; but though, by these means, I have usually expedited the eruptive process, I have been in some instances foiled. This may be owing to mismanagement of the preparation or its application. Dr. Bradley, in his paper, says that he ordered a scruple of tartarized antimony to be reduced to a fine powder, moistened with water, and to be rubbed in at bed time ; sometimes half a drachm. He thus states the effect, which was certainly not expeditious by this mode : “ On the

* Sugar prevents the ointment from becoming rancid.

second or third day after the course has commenced, the patient is harassed by a sense of heat and itching in the part rubbed, or in the course of the lymphatics towards the thoracic duct. If the part so affected be rubbed, or in any degree irritated (from which few can refrain at first,) an eruption of small watery pustules takes place immediately ; and if the patient, taught by experience, abstain from irritating the part, the eruption will nevertheless appear, though somewhat later, and in smaller quantity." Such particulars are of importance, especially with relation to hydrophobia, where it must necessarily be useless, and the faint hopes which I entertain of its benefits be frustrated, unless the effect be expeditiously produced. The irritability of the skin varies so much, even in the same individual, that the interval of its action cannot be easily determined. In the case of a gentleman, who is subject to slight epileptic attacks, which have been much mitigated by it, the influence of an irritable state of the brain upon the skin, is beautifully shown ; for, when free from any pain or affection of the head, pustules cannot always be produced at all ; but whenever he has a return of his disorder, they show themselves very soon after the application is made. In hydrophobia and tetanus the greatest attention should be given to expeditious methods of producing the effect. The extent of surface on which it was applied, in the maniacal cases, was rather ample. (See Cases.)

The stimulus of the eruptions should be kept up for some time after its first effects have been exhibited, which may be done with facility ; and I do not find that patients, when a little habituated, much regard it.* Sometimes it will be necessary, as is shown in more than one of the cases. Small quantities of a more diluted ointment, by re-application to the same part, will answer the purpose ; but, if that be too tender, it may be advisable to renew it on some other. It will be also necessary to let the pustules die away gradually, as the sudden loss of their specific stimulus may be injurious to the constitution. We have yet to ascertain whether it is essential on what particular part it is applied, and whether the sympathies arising from applications made on different parts admit of distinction. We must

* A gentleman who derived great benefit from the use of the ointment in a case of severe chronic rheumatism with lumbago, informed me, that the troublesome itching he felt from the vesicles in the course of their progress was effectually allayed by the use of the following cerate, spread on linen, and applied to the part.

Melt together equal quantities of unsalted butter and bees-wax. Let it remain over a gentle fire as long as any scum arises, which must be carefully taken off.

consider nearly all that is now said respecting its application as merely pointing out a stepping-stone, and not absolutely conclusive. There may be other applications, which may produce pustules more expeditiously. I have known vesicles brought out by a liniment of sulphuric acid and oil, but without having the same influence, *because their constitutional action is probably different.*

Permit me, by way of conclusion, to recapitulate the principal points of inquiry which are here submitted to your consideration for more complete elucidation.

1. The peculiar influence of factitious eruptions, in contradistinction to simple counter-irritation.

2. To what extent the sympathy of the constitution may differ in eruptive affections which are confined to the surface of the skin, and in those which perforate it.

3. The applicability of the conclusions to different methods of varying artificial eruptions, with the view of calling into action the different degrees of sympathy.

4. How far the peculiar constitutional influence results from the *eruptive* form of the local irritation excited, and is analogous with the laws of secretion.

5. To what extent the analogy between artificial and spontaneous eruptions, in the exchange of diseased actions, obtains.

6. How far the brain and nervous system are the media through which spontaneous eruptive diseases, and artificial eruptions, influence diseased action.

You are to consider what I have here given you as a concise history of the effects of tartar emetic on the skin, as far as I have hitherto considered it as important. Many more cases than I have here detailed have recently occurred, some in their nature so very interesting, that I can scarcely avoid presenting them. Take, if you please, the following outline of two of these, with a promise that you may expect them given more fully, as they are so very important, on a future day. One is a case of hysteria, in a young lady of a peculiarly delicate constitution, and attended with symptoms of rare occurrence in this disease.—The morbid sensibility of the spinal cord, from its extremity to the brain, was so evident, that merely walking across a room, if her steps were not cautiously attended to, gave an intolerable jarring sensation, from the lower portion of the spine to the brain itself. It was of three months standing, and she had been attended by gentlemen of highly distinguished eminence in their profession ;—but the ordinary remedies availed little. The other was a case of scrophulous ulceration and thickening of the periosteum of the left fore-arm, which, in spite of those remedies

deemed most efficacious, had been gradually advancing nearly for the space of three years, and very little hopes were entertained of the limb's being saved. Seeing the efficacy of the artificial pustule, in internal derangements of the vital organs, I recommended the patient to apply the ointment on the sound arm. After it had produced its usual effect a few days, the wounds assumed a new aspect, and the healing process went on with such wonderful rapidity, that at the expiration of a little more than a month, one out of three wounds was healed, and the other two fast approaching towards it, with a sensible reduction of the thickening of the periosteum; but here, for the present, I must drop the subject, and hasten to subscribe myself,

My dear CHARLES,

with best wishes,

your faithful friend and servant,

EDWARD JENNER.

Berkeley, Nov. 1821.

II.

Memoire Physiologique sur les Maladies Purulentes et Putrides, sur la Vaccine, etc. Par B. GASPARD, M. D.—*Journal de Physiologie, etc.* Par F. MAGENDIE, Membre de l'Institut. Jan. 1822.

From the London Medical Expositor.

THE very interesting experiments made by this ingenious Physician, in order to ascertain the action of the animal fluids, when introduced into the circulating system, in their natural, diseased, and decomposed state, are calculated to throw considerable light on the nature of a number of diseases. The novelty of such inquiries, but more especially the importance of the results which M. Gaspard has obtained from them, demand a full, but condensed detail of his observations.

Exp. 1.—On the 6th of September, 1808, M. Gaspard injected into the jugular vein of a middle-sized dog, about two drams of white, coherent, fetid pus, procured from a large common ulcer, and mixed with a little water, to diminish its viscosity. The animal, at the moment of the injection, became agitated, and went through the action of swallowing. He whined, appeared weak, and vomited more than six times in the course of the day. An hour after, there was an evacuation of excrements, and of thick, troubled urine, which gave a little relief; however, towards the evening, he was very sick, lying on his

side, with the legs stretched out, the respiration insensible, and the pulse very weak. Ten hours after the experiment, he passed blackish, liquid, and extremely fetid stools, which brought about an immediate relief, and a quick recovery. The animal regained its appetite; and on the following day was quite well.

Exp. 2.—"On the 8th of September, I injected into the other jugular vein of the same dog, nearly three drams of the same pus; and after some time, there came on, as in the first case, weakness, vomitings, frequent evacuations of urine; and twelve hours after the injection, liquid stools, whitish, very fetid, and frequent. Death supervened, within twenty-four hours, preceded by additional excretions. On opening the body, there was no perceptible alteration of the intestines nor of the other organs."

Exp. 3 and 4.—The first was made on the 15th; the second on the 18th of September, on the same dog. In the former, he recovered, after frequent evacuations, from symptoms similar to those already described. In the latter experiment, death was occasioned.—*Dissection.* The inferior portions of the lobes of the lungs were inflamed, and nearly hepatized. No other lesion was observed.

Exp. 5.—Three drams of recent pus were injected by the jugular vein of a small, lean, and nearly scorbutic dog. In three minutes, vomiting, expulsion of urine, tenesmus, and violent rigidity of the limbs, came on. Increased vomiting; frequent, liquid, and very fetid evacuations afterwards supervened; and at the end of five hours, the animal died, under an agony of tormina and tenesmus.—*Dissection.* The intestines appeared thickened externally. Their mucous membrane was inflamed and swollen, especially in the colon and rectum.

Exp. 6.—On the 21st of September, M. Gaspard threw into the veins of another dog, middle-sized, but robust, half an ounce of the same pus, a little older, and more putrid than that used in the foregoing experiment. But about as soon after, the animal, as the others, had vomiting, with violent efforts, which brought away excrements, solid and moulded, as if in the ileum; afterwards, frightful nervous symptoms; wandering vision; excited sensibility; involuntary gambols of the whole body; convulsive attacks, followed by faintness; hiccough; painful and short howls; staggering walk, without any apparent object; a kind of furious delirium; then burning thirst; dyspnoea; beating of the heart, which vibrated and sounded through all the chest, &c. supervened. This state continued about a couple of hours; and the dog expired in dreadful convulsions, without

having critical evacuations. *On opening the body*, which was still warm, the venous blood was very coagulable, not allowing the serosity to separate by standing. The pericardium contained a little effused serum. The left ventricle of the heart was thickened and inflamed; it presented, upon its inner surface, spots of the colour of wine lees, formed by a kind of pellicle, which disappeared only after rubbing and continued washing. The other organs appeared healthy.

Exp. 7.—The 18th of September. About two drams of pus were introduced by the serous membrane of the testicle into the abdomen of a little dog, without producing violent pain; but soon after, vomiting, with violent efforts, evacuation of urine, fever, and dyspnoea, came on. After three hours, the abdomen was convulsed, drawn in, and very painful upon pressure, as in peritonitis; and death ensued twelve hours from the time of the injection. *The body, being opened*, presented a reddish peritonæum, rather inflamed, and containing more than an ounce of bloody, inodorous serum. The mucous membrane of the intestines was rather red and inflamed.

Exp. 8.—Was a repetition of the former. The animal died in twelve hours, after the same symptoms as described in the last experiment.—*Dissection.* The peritonæum was inflamed: it contained a small glassful of sanguineous serum, of a fetid odour, suspending albuminous flocculi, which adhered to this membrane. The mucous coat was a little inflamed.

Exp. 9. On the 28th of September, M. G. injected pus into the left pleura of a little bitch. It was followed by a painful oppression of the respiration, with apparent pleurisy. However, twenty hours after, the symptoms being less intense, and death not appearing likely to follow, he killed the animal.—*On inspection of the body*, he found, in both cavities of the pleura, which was inflamed, and covered with albuminous flakes, a sero-sanguinolent, inodorous fluid. The lungs were sound.

Exp. 10.—On the 28th of September, 1808, M. G. introduced some pus into the cellular texture of a dog. It was not apparently absorbed. It caused, however, a hard inflammatory tumour that terminated in an abscess.*

* M. Gaspard draws the following conclusions from the ten foregoing experiments:—

1. Pus introduced into the circulation in small quantities, causes considerable functional derangement, from which the animal recovers, after it has been expelled from the economy by means of a critical excretion of urine, or of fecal matters.

M. Gaspard's intention, after having made the foregoing experiments, was to perform others with different kinds of pus, especially with that of gonorrhœa, syphilis, cancer, variola, and

2. When introduced at successive periods in the same animal, it produces death.

3. When injected into the veins in a large dose, it produces severe inflammation ; namely, peripneumonia, carditis, dysentery, &c.

4. It appears susceptible of being absorbed, causing at the same time inflammation of the serous membrane and cellular tissue, with which it had been placed in contact.

5. The majority of symptoms occurring in hectic or phthisical fevers, appear to admit of being referred to the presence of pus in the circulation.

M. G. also infers, that the phenomena which are manifested in the course of cancerous ulceration, old dropsies, mercurial ptyalism, gangrenous affections, drunkenness, and in consequence of various ingesta, or ailments, may be attributed to the absorption of a portion of them into the blood. The author farther proceeds to remark, that the presence of pus in the circulation, giving rise to similar derangements in the secretory functions with those evinced in his experiments, has been proved by the pathological observations of Kerckring, Holler, Sulp, Cornax, Bonet, Storck, Laennec, and J. F. Meckel. "But," he adds, "in all these cases, the pus must necessarily have circulated for a considerable period with the blood, without producing a speedy death : it appeared to have acted by inducing the hectic phenomena which terminate in the destruction of the patient." M. G. considers that absorption frequently takes place in various diseases characterized by suppuration, either through the medium of the veins, or of the absorbents, or of both. Although absorption was not established in the 7th, 8th, 9th, and 10th experiments, still it appeared very probable, from the appearances observed after the injection of the pus within the pleura and peritonæum. In these instances, the fetid odour disappeared, and inflammation of the mucous membrane of the intestines supervened. Experiments 18, 19, and 20, about to be given, will farther confirm the opinion of the author. He adduces, in addition, the observations of M. Baumes, who found pus in the larger absorbent coming from the mesenteric glands, which were in a state of suppuration ; those of M. Magendie, who had detected it in the veins ; and those of M. M. Portal and Dupuytren, who observed this fluid in the lymphatics, in the vicinity of large abscesses.

We consider it no easy matter to prove that the contents of lymphatic vessels are or are not pure pus ; and it is still more difficult to show that pus forms even a part of the matters which they contain. The author's arguments, derived from the symptoms which supervene to the disappearance of certain eruptions, especially of

vaccinia. But, circumstances not having allowed him, he only made the three following with the vaccine matter :--

small-pox, may be viewed, either as corroborative of his opinions, or disproving them, according to the light in which they are held. Because, if the pus be absorbed at once, and in abundance, into the circulation, without having experienced, during its route, any change or assimilation in the various vessels and glands through which it has passed, we may readily grant, that greivous derangements will be induced in the system. If, however, such changes be considered actually to take place, the absence of any great constitutional disturbance may be explained, while the absorption of the morbid secretion is at the same time allowed. It must not be overlooked, during our speculations on this interesting subject, that not only are changes going on in the matters which are absorbed, which appear to dispose to that process ; but that certain portions of such substances are taken up by the vessels, to the preference, or to the entire exemption of other portions ; and that even when arrived in the circulation, either directly, or by the circuitous route of the lymphatics and glands, if they are not sufficiently assimilated in their course, they are eliminated from the blood by the secreting organs. There is no doubt, but it is during the secerning process that the extraneous matters in the blood disorder the operations of these organs, and even induce structural derangement. Hence the phenomena which appear towards the advanced stages of many diseases are evidently the result of disordered functions ; which state, indeed, constitutes the commencement of all ailments. If one organ is impeded in its office of ridding the economy of certain noxious materials, and not vicariously supplied by any other, such materials must therefore accumulate, and become a source of irritation throughout the system ; but more especially to the organ, whose function it is to eliminate them. Thus, if from certain causes, which may be demonstrated, the elements entering into the composition of the bile abound in the system, a source of disorder or of irritation is present in the blood. This irritating cause must operate upon those parts which are sensible to its action, and to which it is incessantly and immediately applied. Derangement of the whole vascular system becomes the consequence of such irritation offered to the nerves ramified upon the heart and blood-vessels, but more especially in the organ destined to combine and to secrete, under new forms, the materials now so abundantly presented to it ; and hence all the phenomena of bilious diseases and bilious fevers will be produced according to the varying circumstances by which an individual may be influenced, or which may characterize the disposition of his system at the time. Other derangements in the secreting functions could be adduced, in illustration ; this one will, however, be sufficient to place our proposition in an intelligible point of view.—EDITOR.

Exp. 11.—On the 5th of November, 1817, the author threw into the jugular vein of a young sheep, which had never been vaccinated, nor subject to the rot, an ounce of cold water, in which he had dissolved six vaccine crusts, taken off, some hours before, from the arm of a child, and to which he had added a large drop of vaccine matter from a vesicle at the eighth day. But on the introduction of this liquor, which was viscous, troubled, yellowish, and of a stale smell, the animal went through the act of swallowing, without giving evidence of pain. It afterwards did not appear affected, suffered no lesion of the functions, and preserved its appetite and vivacity; there followed no eruption of pimples on the skin; and the wound healed very well.

Exp. 12.—The 27th of October, 1820, M. G. injected by the jugular vein of a little bitch, four months old, which had not had what is called the *maladie des chiens*, half an ounce of water, in which were dissolved, by a maceration of some hours, four vaccine crusts; and in which he had also soaked a thread, impregnated, the same day, with fluid virus. An hour after only, the animal was affected by this injection, refused food, and vomited. The vomiting was renewed afterwards more than ten times, with burning thirst, evacuations of urine, and uneasiness, which lasted all the day; but on the morrow, there was a complete recovery, return of appetite, and no vaccine eruption appeared.

As pus is an animal substance which is partly putrid, it was proper to ascertain whether its action upon the system depended upon its putrid qualities, or upon some other peculiar property. In order, therefore, to compare its effects with those of putrid sanies, he made the experiments which follow:—

Exp. 14.—“On the 18th of June, 1809, I injected, by the jugular vein of a little bitch, half an ounce of the sanies, or fetid liquor, proceeding from the simultaneous putrefaction of beef and dog’s blood. At the moment even the animal went through the act of swallowing several times, and soon after had dyspnœa, uneasiness, and faintness. It lay on its side, refused food, and soon passed excrements and then urine. But after an hour there came on prostration of strength, gelatinous, bloody and frequent stools, dysentery, and redness of the conjunctiva; afterwards pain of the breast, and of the belly upon pressure, gradual loss of strength, bilious, gelatinous, and bloody vomit, and death three hours after the injection supervened. *On opening the body*, when yet warm, the lungs were inflamed in a peculiar manner, or rather congested. They had a violet or black-

ish colour, with many ecchymosed spots, or petechiæ, which were found also in the substance of the left ventricle of the heart, the spleen, the mesenteric glands, the gall-bladder, and also in the subcutaneous cellular membrane. The peritonæum contained some spoonful of reddish serum; but the mucous membrane of the digestive canal was principally affected. That of the stomach was somewhat inflamed; in the intestines, and particularly the duodenum and rectum, it was considerably so, with a livid colour, black spots, and a bloody, gelatinous covering, like wine lees, or the washings of meat. This inflammation was also accompanied by slight thickening of the membranes, and a hæmorrhagic or scorbutic appearance."

Exp. 15.—"On the 10th November, 1820, I repeated the preceding experiment, throwing into the jugular vein of a pretty large dog an ounce of a thick reddish fluid, procured by macerating and digesting in water a little flesh of beef already fetid. The animal was scarcely untied when it passed liquid stools, very fetid, with a quantity of urine; there were frequent efforts to expel the foul matter, hurried and deep respiration, a small quick pulse, loss of strength, position on the side, and want of power to stand. After an hour came on tenesmus, with a kind of diarrhœa, or dysentery, marked by liquid, bloody, sanious, and fetid stools, which continued till death, which took place two hours and a half after the injection. *On opening the warm body*, the lesions were the same as in the preceding experiment. The lungs were marked in a similar manner with black, brown, or livid spots, as large as a centime, the intestinal canal filled with mucous and bloody dysenteric sanies like that in the stools, and the mucous membrane of the intestines equally red, livid, and of a hæmorrhagic or scorbutico-inflammatory look."

Exp. 16.—"The 14th July, 1821, I injected into the jugular of a middle-sized dog two ounces and a half of a fetid, thick, but not acid liquid, produced from the putrefaction of cabbage leaves, kept during two days at a temperature of twenty degrees of R. in an equal quantity of water. Copious stools, of a liquid, fetid, and soot-coloured appearance, analagous to the dejections of *melæna*,* supervened in the course of nine hours, accompanied with vomiting and difficult respiration.

15th.—"Great prostration of strength, a small and febrile pulse, ardent thirst, and paroxysms of palpitation of the heart were very apparent."

* Several of the phenomena of yellow fever may be here recognised.—EDITOR.

16th.—“ The symptoms were less violent ; thirst, fever, want of appetite, and occasional vomiting of his drink, were however present.”

17th.—“ His state was the same.”

18th.—“ His symptoms were aggravated. He died the following night on the fifth day of the experiment.—*Dissection*. Slight phlogis was observed in the mucous lining of the bronchiæ. The left ventricle of the heart presented several brown ecchymoses, which dipped into its substance. An albumino-fibrinous concretion, of a yellowish-white homogeneous appearance, weighing two drams and a half, filled in part the right ventricle. It was detached in the ramifications which it extended into the pulmonary artery, the superior vena cava, and venæ azygos, axillaris and jugularis dexter. It adhered only to the ventricle by a surface of a nail's breadth, which possessed an inflamed and torn appearance. The mucous membrane of the intestines, especially of the duodenum and rectum, was inflamed in longitudinal streaks, and without any thickening of its texture, or ulceration. It approached in some places the character of ecchymosis. The mucous glands were swollen, and very apparent.”

Exp. 17.—M. Gaspard, on the 21st September, 1821, injected very slowly into the jugular vein of a small dog an ounce of the fluid produced from the putrefaction of the stalks and leaves of white beet. Want of appetite, agitation, vomiting, and shortly afterwards dejections, at first soft, but subsequently liquid and mucous, supervened. Dysenteric evacuations, bilious vomitings, pain of the abdomen on pressure, and consecutively sanguineous, fetid, black fuliginous stools, similar to those of *melæna*, augmented the sufferings and exhaustion of the animal, and destroyed it eleven hours after the injection.—*Dissection* was performed while the body was yet warm. The lungs were engorged, but presented neither ecchymosis nor petechiæ ; the heart and stomach were without lesions ; the gall-bladder was ecchymosed ; the intestinal canal, from the pylorus to the anus, was covered by a mucoso-sanguineous liquid, similar to wine-lees ; but nevertheless the mucous membrane was nearly healthy, unless in the duodenum, rectum, and commencement of the jejunum, where it was of a violet-red colour, and slightly inflamed in longitudinal streaks.

M. Gaspard considers that these two experiments show that the putrid matter of vegetables acts upon the system, as that of animal substances, but in a less degree. He proceeds next to mention facts which are of his own observation, relative to their absorption.

Exp. 18.—"The 28th July 1821, I threw into the sub-cutaneous cellular tissue, in the inguino-abdominal region of a little dog, about three ounces of putrid liquor, in which had remained, for one night, a little raw meat corrupted and slimy. The animal evinced great pain on each injection, refused food, and became agitated, rolling upon the ground, uttering cries, and having the belly painful to the touch. Some hours after a local cellular tumour arose, which was hard and painful.

"On the 29th. The same condition; and anorexia, with the abdomen retracted, and the swelling painful, shining, emphysematous, and looking gangrenous along the penis and about the groin, with the eyes red and suffused.

"On the 30th. Towards the evening, sixty hours after the experiment, rupture took place of the tumour, which had become gangrenous, with discharge of black and putrid sloughs, leaving exposed the penis and abdominal muscles; the eyes were full of humour as before.

"On the 31st. Convalescence, and return of appetite, were apparent; the eyes nearly free from rheum; the belly not very painful; and the wound, which the animal cleaned with its tongue, well conditioned.

"Upon 1st of August. Recovery was more evident; the appetite almost natural; the eyes clear, the wound red, but with great loss of substance. After this, the health returned, and in four days the recovery appeared complete, except that the wound filled rapidly with large fleshy granulations. The dog was then submitted to the following trial* :—

Exp. 19.—"On the 5th of August, 1821. In the morning I injected, in ten throws, into the peritonæum, five ounces of a corrupted liquor, procured from blood and beef-flesh fermented in water for forty-eight hours at the temperature of thirty-five R. On each injection, the animal uttered cries, shook about, and passed nearly every time a great quantity of limpid inodorous urine, which was certainly not that accumulated during the night, and contained in the bladder. After the experiment all aliments were refused; there came on vomiting, alvine excretions with painful efforts, weakness, lying upon the belly, which was sensible to pressure. An hour after this, vomiting and purging recommenced, and were from this time frequently repeated;

* M. Magendie attributes the different effects produced by the injection into the veins, from that arising from injection into the cellular tissue, to the deficient vascularity of this substance, and to the inflammation of the capillary veins, induced by the presence of the injected fluid, preventing or diminishing their faculty of absorption.

the stools became mucous, gelatinous, and dysenterical. The large wound produced by the former experiment now assumed a scorbutic and spotted lividity ; the slightest pressure on the belly occasioned convulsive cries ; motion was painful to the animal, it therefore walked unsteadily. At last, dyspnœa, continued tenesmus, and death, came on nine hours after the injection. *On opening the body*, about a bottle of bloody serosity, inodorous, and of the colour of wine-lees, was contained in the abdominal cavity. The peritonæum was inflamed, of a purplish red, and as it were ecchymosed over all its surface. The inflammation was excessive, with black spots and extravasated blood all along the mesenteric vessels, and in the concave curvature of the intestines, where they penetrate between the duplicature of the peritonæum. All the mucous surface of the digestive canal, from the cardia to the anus, was uniformly much inflamed, particularly in its folds, and of a deep red, inclining to violet, or blackish ; but that of the stomach was only inflamed in its folds. The intestinal canal contained a gelatinous mucus without blood ; the muscular coat did not partake of the inflammation of the two others ; the bladder was empty, contracted, and inflamed on the exterior, and very white within ; the pleura of the left side contained, like the peritonæum, a red and bloody serum ; the spleen and the lungs were spotted with stains, or ecchymosis ; and, lastly, the wound, which before the injection was covered with red pimples, had a blackish look, as if it were scorbutic, or gangrenous."

The 20th experiment, performed by M. Gaspard, was a repetition of the former. It furnished nearly the same results.—M. G. considers that the three experiments which have been just related, viewed in connexion with those made with pus, prove in a satisfactory manner the absorption of putrid substances. We are not so positive, however, of this as he appears to be. The experiments and arguments which he has adduced, are certainly much in favour of the occurrence, although they do not unequivocally prove it to be a fact. The following are the arguments which he has offered upon the subject :—

1. The symptoms resulting from their injection into the peritonæum are very similar to those arising after they have been thrown into the veins.
2. Although injection into the former tissue produces violent symptoms locally, still derangements supervene in different and in remote organs, which can only be explained by considering the process of absorption to have taken place. Such were remarkable in Experiment 16 and 18, where the secretion in remote organs became abundant, unusual in appearance, and puriform. In Exp. 7, 8, 19 and 20, where the

mucous membrane of the intestinal canal was violently inflamed, yet the substance between it and the inflamed peritonæum presented no such character. The other proofs on which the author rests his arguments, are :—1. The copious secretion of urine which always followed the injection, arises, as he supposes, from the absorption of the liquid in which the irritating substances were dissolved. We should suppose that the first evacuation would result from the irritation of the peritonæum inducing contraction of the bladder. 2. The absence of the odour, and sensible characteristics of the putrid substances injected into the peritonæum, in the fluid which that membrane has been found to contain after death. 3. The derangements observed in the lungs, pleura, spleen, &c.

M. G. goes on to remark that the general effect upon the animal system, arising from putrid substances introduced into the circulation, either by injection into the veins, or by absorption, appears to be a peculiar kind of inflammation, accompanied with a species of hæmorrhage of a passive nature, taking place from the mucous membrane of the intestinal canal. As, however, both animal and vegetable substances, in becoming decomposed, give out carbonic acid, hydrogen, sulphur, and ammonia, it would be well, he adds, to know which of these substances has caused the effects which he has observed. The following experiments, he thinks, may in some measure illustrate this obscure subject :—

Exp. 21.—"The 26th July, 1812. I threw into the jugular vein of a little dog an ounce and a half of water which had boiled, shaken up strongly and frequently for several days, with an equal volume of carbonic acid gas, procured from the decomposition of carbonate of soda, by sulphuric acid. Some minutes afterwards the animal vomited, and this was repeated four times, and with violent efforts, during three hours ; there were also two stools, the first soft, and the second quite liquid. To these evacuations succeeded, during two hours, a state of great weakness, sluggishness, somnolency, with harsh and uneasy respiration ; but five hours from the injection, the dog, after passing a great deal of urine, became better, recovered its appetite, and was soon perfectly restored."

M. Gaspard performed *Exp. 22* upon a young fox. The result was almost similar.

Exp. 23 and *24* were repeated on large dogs, with a less quantity of the carbonic acid. The effects were very slight ; indeed, scarcely any derangement of function was observed to follow.

Exp. 25.—"March 24, 1816. I introduced into the vein of

a middle-sized dog half an ounce of sulphurated hydrogen, liquid and clear, very fetid, and readily blacking silver, giving off bubbles of inflammable air at its surface, preventing the development of frogs' spawn, as well as the vegetation of onions, and obtained by the maceration and digestion of sublimed sulphur in water during several years. 'This injection caused pain, agitation, many movements of deglutition; afterwards evident uneasiness, rejection of food, slow and uncertain walk, slight somnolency, &c. But after some hours, the appetite returned, and recovery followed without further disturbance.'

M. G. performed the next experiment on a dog, with two ounces of water, impregnated with pure hydrogen gas. No derangement of function supervened.

Exp. 27.—"On the 9th of Sept. 1821, I injected into the jugular vein of a little sucking pig three weeks old, an ounce of distilled water, mixed with twenty-four drops of ammonia, which was slightly odorous, and probably a little carbonated by the contact of the air, as it deposited a white crust upon the sides of the flask, although it did not effervesce on the addition of sulphuric acid. There was no indication of pain upon the injection; but after some time came on evacuation of urine, and of hard dry stools; uneasiness, fainting, loss of strength, fever with shivering, pain of the belly upon pressure, and after an hour a mucoso-bilious liquid passage, renewed twenty-five minutes after. Four hours and a half after the injection another liquid and brown stool was passed. It was mixed with clots of blood. From this time return of strength and appetite was observed; the animal sucked. Next day the stools were again liquid. It continued for a week afterwards in a state of languor, without marked disease, and died at the end of nine days. *On opening the body* there were found ecchymoses or petechiæ in numbers about the heart, intestines, and coverings of the belly; besides, the appendiculum intestinum was very red, swelled and inflamed in its muscular and mucous coat, with evident suppuration in the interior."

Exp. 28.—"The 29th of Sept. 1821, I repeated the foregoing, by throwing into the jugular of a puppy twenty-five drops of the same ammonia, mixed with three drachms of distilled water, which caused pain and agitation in the little animal.—Afterwards plaintive cries continued for three hours, refusal of food, dyspnœa, pain of the belly on pressure, alvine evacuations, repeated vomitings, abundant evacuations of urine, came on. But these symptoms gradually diminished, and five hours after the injection the appetite and health returned.

"The same day another injection of forty drops of the same

alkali, by the other jugular, was tried, which nearly killed the dog at the moment, by producing a kind of syncope or suffocation, with vomiting, and expulsion simultaneously of urine and *fæces*. Life, however, gradually returned, and with it uneasiness and plaintive cries, continuing for several hours, as in the first instance, then recovery.

“The next day I injected more than thirty drops, with similar effects; but on the 1st of October, having killed it in some seconds by a different experiment, I found, *on opening the body*, one lobe of the left lung inflamed, congested, blackish, and very hard; but the intestinal canal was healthy, except a large inflamed spot on the mucous membrane of the duodenum.”

Exp. 29.—“25th of September, I introduced into the subcutaneous cellular tissue of the back, which was in an emphysematous state, of a small puppy, thirty drops of the same ammonia, mixed in three drams of distilled water. After this injection, violent pain, sensibility of the skin to contact, continued cries; afterwards alvine evacuations, at first excrementitious, then liquid, bilious, and gelatinous, supervened. The animal died in twenty-four hours.—*Dissection.* The skin, and cellular texture of the back and sides, were inflamed, red, violet, and infiltrated by a sanguineous serum. The mucous membrane of the duodenum was much inflamed. This appearance was observable, in a less marked degree, in the rest of the intestinal canal.”

Exp. 30.—Was a repetition of the former, with a solution of the muriate of ammonia. This liquid was not absorbed. A large inflammatory tumour, followed by a tedious suppuration, was the result.

M. G. concludes from these experiments that it is not owing to the ammonia, that putrid substances introduced into the circulation produce the effects which he has detailed; because the hæmorrhagic inflammation of the mucous membrane of the intestines, which was remarkable in the early experiments, did not result from the injection of the ammonia. He afterwards proceeds to detail the particulars of some experiments in which he injected several of the recent secretions of the human subject, as the saliva, urine, bile, &c. into the veins of dogs. They confirmed those which had been made with the same substances by Bichat, Magendie, and Deidier. The following experiment confirms the information we have previously received respecting the effects of *spurred rye* upon the system; and appears to point to some of the causes of putrid diseases.

Exp. 36.—“On the 31st August, 1815, I injected into the jugular vein of a middle-sized dog, an ounce and a half of a

strong and concentrated decoction of the spurred rye previously reduced to powder. Loss of appetite, distress, plaintive cries, feeble gait, with an evident dragging of the posterior extremities, violent vomitings; a few hours afterwards embarrassed respiration, and a febrile pulse, supervened. He appeared much recovered on the following day. His appetite, however, was not restored, and the feebleness of his posterior limbs continued. I then injected an ounce of the same decoction into the jugular. It produced at first vomiting only: but four hours afterwards, embarrassment of the chest, stertorous dyspnœa, a very frequent pulse, prostration of strength, an impossibility of standing, or walking, syncope, interrupted by whining, successively supervened during nine hours. At the end of this period renewed vomiting of bile, and hiccup, came on; and death thirty hours after the first injection.—*Dissection*. The lungs were studded with small round spots, black, without cohesion, and possessing a gangrenous character. The mucous membrane of the stomach presented two black spots arising from effused blood. The muscles were of a much darker colour than natural. The brain was violet, livid, and firmer than usual. The other organs were entire.”

M. Gaspard has given a few more experiments of less interest; they furnish results similar to those we have detailed. We will conclude this very extended account of his memoir by adding a few of his reflections. They are very brief, and refer chiefly to the effects which have been observed to follow the use of putrid aliments upon the human constitution. These, as far as they have been correctly observed, agree with his experiments. M. Fodere has related that at the siege of Mantua several individuals who had existed on the semi-putrid flesh of a horse, contracted a scurvy, and in some instances gangrene of the extremities. Other instances might be adduced in proof of this point. The effects arising from the use of spurred rye, of old and corrupted vegetable productions, and of animal substances in a state of putridity, are well known. They bear a very striking relation to those which resulted from the author's experiments. M. G. next takes a view of the causes which induce malignant or pestilential diseases, as they relate to his own observations. This subject is not entered into, and far less pursued in a satisfactory manner. He merely hints at the connexion. As, however, his present experiments, and others which he may be induced to make, may furnish him with data for future speculation, we will not criticise the very few observations he has now offered. They merely point to obvious relations, in a very general manner. The experiments are chiefly interesting, and these we have given almost entirely.

MONTHLY SUMMARY

OF PRACTICAL MEDICINE.

THIS department of our Journal will embrace short selections from Foreign Journals—condensed histories of interesting cases, and an early notice of such improvements as occur in the several branches of Medical Science.

It will contain selections on the subjects of

1. ANATOMY AND PHYSIOLOGY.
2. SURGERY AND MIDWIFERY.
3. PATHOLOGY AND THERAPEUTICS.
4. MATERIA MEDICA AND PHARMACY.
5. CHEMISTRY AND NATURAL HISTORY.

With this arrangement, we hope to present our readers with a Monthly Summary of the most important articles, which are scattered through the numerous Foreign Journals, of which we are in possession, and to make them acquainted with whatever is interesting in the medical literature of Europe.

ANATOMY AND PHYSIOLOGY.

An Account of some Experiments on the Nerves ; by M. MAJENDIE. *With some Observations,* by JOHN SHAW, Esq. Lecturer on Anatomy in Great Windmill-street.

IN the last Number of the Journal dePhysiologie, several very curious experiments are related by M. MAJENDIE, which are not only important in themselves, but are interesting, as they corroborate some experiments which had been previously made in this country ; but of the performance of which M. Magendie does not appear to have been aware. Perhaps, the detail may be acceptable to some of your readers.

Experiments upon the Functions of the Roots of the Spinal Nerves.

“ For a long time I have been desirous of discovering what effects would be produced upon an animal by dividing the posterior roots of the spinal nerves. I have made frequent attempts to cut those twigs, but they all proved unsuccessful, in consequence of the great difficulty which is met with in opening the vertebral canal, without at the same time so injuring the spinal marrow, as either to destroy or to be productive of great

torture to the animal. In the course of last month, however, a litter of eight puppies, about six weeks old, having been brought into my rooms, I thought they afforded a good opportunity for renewing my attempts to open the vertebral canal.—With one stroke of the knife, I succeeded in exposing the posterior half of the spinal marrow, enveloped with its membranes; and I had only to divide the dura mater which surrounds it, to lay the whole organ completely bare. By this method of proceeding, I had under my eye the posterior roots of the lumbar and sacral nerves; and, by raising these alternately, with a pair of fine scissors I could easily divide them upon one side, without at the same time affecting the spinal marrow.

“I had not entertained the slightest idea of what would be the probable result of this experiment; and, after the wound had been closed by the application of a suture through the skin, I observed the effects produced on the animal. I was fully persuaded, at first, that the division of the nerves had completely paralyzed the member which they supplied; for, in fact, it showed no sensibility, either when pricked or violently pinched, and was to all appearance totally motionless; but soon, to my surprise, it began to move very distinctly, notwithstanding the sensibility of that part was quite extinguished.

“In a second and third experiment, I was presented with exactly similar results; and it then occurred to me as more than probable that the posterior roots of the vertebral nerves were possessed of functions distinct from the anterior, and that they were the nerves which were destined for sensibility.

“It was a natural suggestion, in order to make good this conclusion, to cut the anterior roots only, and leave the posterior ones undivided; but this I discovered was more easily imagined than performed: for at first sight it appeared to me an impossibility to expose the anterior part without injuring also the posterior roots. This, however, did not deter me from inventing plans to overcome the difficulty, and at length, after two days’ consideration, I determined to pass a kind of cataract knife in a direction anterior to the posterior roots. From its blade being very narrow, I expected that, by directing the sharp edge along the posterior face of the bodies of the vertebræ, I could by this means divide the roots. This plan, however, I had to resign, on account of the large veins which are contained in this side of the canal, and which were opened by every cut that was made in a forward direction.

“During these attempts, however, I discovered that, by tearing off the dura mater from the spinal marrow, I could display the anterior roots, united in bundles, just where they begin to

pierce that membrane. This was all I could desire, and in a very few seconds I succeeded in dividing all the pairs of nerves which I wanted. In this, as in the preceding experiments, I divided those on one side only, in order that I might have a better opportunity of observing the effects by the contrast.

"It is easily conceived how curious I was to discover the effects of this last experiment; they were distinct, and left no room for doubt: the limb was altogether deprived of the power of motion, and totally powerless, yet its sensibility was evidently preserved. In short, to make the matter perfect, I divided both the anterior and the posterior roots in the same animal; the consequence was a total loss both of sensation and the power of motion.

"These experiments I have repeated and varied upon different animals, and the results, both with regard to the anterior and posterior roots, were confirmed in a manner the most satisfactory. These researches are to be continued, and in the next Number I shall offer a more detailed account of them. For the present let a positive assertion be sufficient, that the anterior and posterior roots arising from the spinal marrow possess different functions; and that to the posterior more particularly belongs sensibility, while the anterior seems to be more especially connected with the power of motion."

The importance of the facts discovered by these experiments must be evident to every one; and it must be gratifying to the true friends of science in this country to find that M. Majendie, whose sole object in these pursuits appears to be the promotion of physiology, has, by his experiments, come to the same conclusions as those which had been previously deduced by Mr. CHARLES BELL, from observations made on the anatomy of the brain and spinal marrow. The truth of these deductions were also by him put to the test of experiments; the results of which, however, though they corresponded with those of M. Majendie, were not so conclusive. As I have entered into some speculations on the same subject, I shall, perhaps, be excused in bringing before your readers the following extract from the last volume of the *Medico-Chirurgical Transactions*:

"I shall, however, take the liberty of trespassing still more upon the time of the Society, by making a few remarks upon a very curious question, which has particularly excited the attention of physicians in all ages since the time of Galen:—Why sensation should remain entire in a limb, when all voluntary power over the action of its muscles is lost; or why muscular power should remain when feeling is gone?

"The attention of Galen was particularly directed to this

question, in consequence of his having been called upon, by some of his contemporaries, to account for the manner in which he had cured a partial paralysis of the finger by applications made to the spine.

“In answer, Galen told them that two sets of nerves went to every part ; one to endow the skin with sensibility, the other to give the muscles the power of voluntary action. This opinion was probably founded on a mere theory ; but the facts lately discovered, and the observations which have been noted in attending to the phenomena of disease, though they do not afford absolute proofs of the correctness of Galen’s supposition, still they go far to establish the fact, that every part of the body which is endowed with two or more powers is provided with a distinct nerve for each function.

“The form of the nerves which at the same time endow the skin with sensibility and the muscles with the power of voluntary motion, is such that they appear to be single cords ; but, if we examine the origin of any of those nerves, we shall find that it is composed of two packets of fibres, which arise from distinct parts of the spinal marrow. These origins are soon enveloped in the same sheath, so as to appear to a superficial observer to form a single nerve.

“It is not too much to suppose that either of these origins may be affected while the other remains entire. To prove this by ocular demonstration will perhaps be impossible, and therefore the question will probably remain undecided. But we have already seen examples of the consequence of injury to a nerve that has a single root, viz. the portia dura ; for, if we cut it, there will be only one set of actions paralyzed ; while, by dividing a nerve which has a double origin, viz. the fifth, we shall destroy two powers, viz. voluntary motion and sensibility. We know, also, that, when we cut through the trunk of a nerve going to the hand, we destroy both sensibility and the power of motion.

“In reference to this subject, I shall state the result of certain experiments which were made about thirteen years ago, by Mr. Charles Bell. The two sets of filaments by which each spinal nerve is connected to the spinal marrow were exposed : on irritating one set, convulsion of the muscles upon which the nerve was distributed ensued ; but, when the other was excited, no perceptible effect was produced. These experiments we have often repeated, and always with the same results ; but, from the violence necessarily used in making them, it has been difficult to ascertain which of the filaments bestows sensibility on the part. It was easily shown that, if only the posterior set

was destroyed, the voluntary power over the muscles continued unimpaired ; but the pain necessarily attendant upon the performance of the experiment prevented us from judging of the degree of sensibility remaining in the part.

“It was, I believe, the result of these experiments which induced Mr. Bell to give an opinion nearly similar to that of Galen, in a short essay on the Anatomy of the Brain, which was printed and distributed among his friends in 1809. An opinion somewhat similar has been lately offered by Dr. W. Phillip, in answer to a query of Dr. Cooke’s.

“If the view which I have here taken of this question be correct, it may lead to this rule of practice. If only one set of functions of a spinal nerve be deficient, we should apply our remedies to that part of the system from which the nerve arises ; but, if both functions are impaired, we must then direct our inquiries to the state of the nerve in the whole course, from its origin to its distribution, as the loss of power is probably owing to some affection of a part of the nerve, after the two sets of filaments by which it arises are united together.”

Since that paper was published, I have made several experiments, which, at the same time that they prove the correctness of M. Majendie’s observations, also establish, in the most satisfactory manner, one of the most important discoveries of Mr. Bell,—viz. that the fifth nerve and the spinal nerves are of the same class, and that they in every respect correspond with each other. At present I shall not enter fully into this question, but only state the following circumstances, which will probably be acknowledged to be correct :

1. That the head and face, having many parts in every respect similar to the neck, trunk, and limbs, must have corresponding nerves.

2. That the manner in which the spinal nerves and the fifth arise by double origins, is very similar.

3. That the two origins of the fifth are united by a ganglion exactly of the same shape and character as those which unite the two origins of the spinal nerves.

4. That the manner in which the branches of the fifth are distributed, and those of the spinal nerves, is the same.

And, lastly, with reference to the anatomy, we find that the same kind of connexion exists between the fifth and the sympathetic, as between the latter and the spinal nerves. In their morbid affections, the similarity also holds good : thus, in the common cases of hemiplegia, the spinal nerves and the branches of the fifth are similarly affected. In this disease, the voluntary power over the limbs and the sensibility of the side affected are

generally destroyed ; but in some cases the voluntary power is lost, and the sensibility continues unimpaired, or *vice versa*. This variety also occurs on the face ; for the jaw will drop, and there will be all the marks of paralysis, but the sensibility of the skin and the sense of taste will continue entire.

In experiments on the nerves of the spine and on the fifth, we meet with the same results. If, as in the operation which is now frequently performed on the nerves of the horse's foot, we cut a spinal nerve after the branches are given off to the muscles moving the part, we shall destroy only the sensibility of that part ; but, if we cut the nerve nearer to the brain, we shall not only destroy the sensibility, but all the power of motion. The same happens in experiments on the fifth ; for, if we cut a branch which is principally distributed to the skin of the lips, we shall destroy the sensibility of the part, but impair the power of mastication only in a slight degree ; but if we divide the nerve further back, then we shall not only destroy the sensibility of the skin, as in the first experiment, but also cut off the power by which the jaws are moved. I cut a branch of the fifth upon the face : the sensibility of the corresponding side of the lip was destroyed, but little paralysis ensued. I cut the nerve nearer the brain, and at a point previous to its having given off the branches to the muscles ; then the jaw fell, and the muscles of that side were powerless. I varied the experiment, by irritating the nerve where it lies in the speno-palatine fissure, immediately after an animal was killed : the jaws then came together with much force, indeed, so as to nip my assistant's finger severely. This last experiment may be compared with the very common one of galvanizing the nerves which pass from the spinal marrow to supply the muscles of the extremities.

When the inquiries with which we are now occupied are farther advanced, I shall enter more minutely into this question : at present I shall only offer you some general observations upon the difference between the original, or spinal nerves, and those of the superadded class.

To distinguish the superadded nerves from those of the spine and the fifth, we may first look to the facts afforded by comparative anatomy,—viz. that the first class corresponds to the number and complication of the superadded organs. If we, then, examine the anatomy of the nerves forming this class, we shall find that, instead of their rising by double origins,—i. e. by distinct roots from the two great spinal columns,—they each arise by a single series of fibrils, from a distinct portion of the spinal marrow. There is no ganglion on the roots ; at least, there is no ganglion at all similar to those which are found on the fifth

or on the spinal nerves : (it is ridiculous to compare the swelling on the par vagum, after it has emerged from the skull, with the ganglion which connects the roots of the spinal nerves.) The manner in which the superadded nerves are distributed is also different from that of the spinal nerves.

If, in the living animal, we expose a spinal nerve, and one of the superadded class on the face or side of the neck, and irritate them, we shall have no difficulty in determining that the spinal nerve is the most acutely sensible to pain : indeed, in the greater number of the experiments which I have made, the degree of sensibility of the superadded nerves seems to be so slight, when compared with that of the spinal nerves, as to make it a question whether they be at all sensible.* If, after an animal is dead, we stimulate a nerve of each class, either with the common pincers or with the galvanic forceps, we shall be convinced that the nerve of the superadded class continues the longest to influence the muscles. But the greatest and most marked difference between the two classes is discovered by observing their natural functions, and the phenomena of disease. Let us take any one of the superadded nerves, the portio dura, for example, which goes to the eyelids, nose, and mouth : by a voluntary effort, we can close the eyelids, or we can frown ; but is either winking or that action of the eyelids and brows which is so marked during mental emotions, or the closing of the eye during sleep, governed by any power of volition ? We can move our lips at will ; but is smiling or laughing, or the action of the lips during anger, under our controul ? or can we whistle or blow, unless the actions of the lips and cheeks are in unison with the respiratory apparatus of the throat and chest ? We can turn up the tip of the nose, or we can pull it down ; but can we command the muscles of the nostrils during violent respiration ? What are we to think of the blindness of those who cannot discover the strong actions produced through this nerve in the muscles of the nostrils and lips, during that state of apoplexy where all voluntary power is lost ? All these complicated functions will be destroyed by cutting the portio dura ; whereas, if we only cut the fifth, which gives branches to all the parts that the portio dura does, these various faculties will continue unimpaired, while the sensibility of the parts, and a set of voluntary actions quite distinct from those already enumerated, will be destroyed.

* Some difficulty arises here from our mistaking compounded nerves for simple ones. On one occasion I was nearly drawn into a mistake by not observing that a small filament of the fifth nerve entered into the portio dura on the face. There may be branches of the nerves of simple sensation combined with those of the eighth and ninth.

If we examine the actions of those parts of the throat and neck which are supplied with branches from the par vagum, we shall discover that they are endowed with the same variety of voluntary and involuntary powers;* and, what is still more extraordinary, we shall find that the actions performed through the medium of the spinal accessory are of the same character. Thus, by a voluntary act, we can raise the sternum in a long inspiration; but, if we put our fingers on the sterno-cleido mastoideus, and snuff quickly up, we shall find that we cannot prevent the muscle from acting; and this involuntary action of the sterno-cleido is still more evident in sighing, sneezing, or coughing.

The phenomena presented when the superadded nerves are affected by disease, are in every respect different from those displayed when the fifth or spinal nerves are in a similar state. Upon this subject I shall not enter, but refer to the several papers which have been already published in the *Philosophical Journals*.

It would, perhaps, be well to make a short summing-up of the discoveries referred to in this sketch, but I will defer this, in the hope that you will, in a succeeding Number, permit me to offer you a short view of the whole question.—*Med. and Phys. Journal*, Oct. 1822.

II. SURGERY AND MIDWIFERY.

Painful subcutaneous Tubercle.

Under this name a troublesome affection has been described by Mr. Wood, in the *Edinburgh Medical and Surgical Journal*. The following case is recorded by Mr. Windsor of Manchester, in one of the late numbers of the same work :

“I was applied to by Ann Knolt, æt. 59, on account of a small tumour, situated immediately under the integuments, on the thonal and radial aspect of the arm, three and a half inches above the wrist, moderately loose to the feel, but most exqui-

* The almost complete destruction of the power over the lips as manducatory organs in those animals which graze, by cutting the portio dura on either side, makes the analogy between the par vagum and the portio dura more striking. The par vagum not only regulates the actions of the larynx and pharynx in breathing, but also in swallowing; so it would appear that the portio dura, in some animals, not only gives the muscles of the nose and mouth power as respiratory, but also as manducatory organs. This question involves a very curious and interesting subject, to discuss which would far exceed the limits of a communication.

sitely tender to the touch. It is about the size of a large pea, or nearly that of a horse-bean, and to the feel of considerable hardness, but she complains very much on touching it. The integuments over it appear healthy, but there is some appearance of a bluish discoloration in the part. She has no pain in it except when it is accidentally touched, and that is followed by the severest pain for several hours, sometimes accompanied with faintness, and with a feeling of heaviness in the parts. On these occasions the pain extends from the part towards the trunk, but not downwards towards the fingers.

About eight or nine years since she had a pleurisy, for which she was bled in the arm three times then, and has occasionally been bled since. It was soon afterwards, and before she was perfectly recovered of her illness, that she felt a soreness in the present site of the tumour when it was touched, as if she had received a blow in the part, but nothing could be seen for two or three years after that time. About six or seven years since she perceived a very small swelling, scarcely larger than a pin's head, which has gradually increased to its present size ; for the last twelve months it has not, she thinks, enlarged.

To remove it I made a small single incision over the centre of the tumour, then dissecting back the integuments a little on each side. I cut round it and removed it. In doing this a small artery bled freely, obscuring the part. The tumour was apparently of the encysted kind ; it was nearly all removed, but a small portion remaining, it was next taken away. In doing this a filament of a nerve was observed going to the part. I cut this away also for the length of an inch, which was followed by a sensation of numbness in the part, so that she said she could scarcely feel any thing in it for a short time. On laying open the small tumour removed, I found its contents consisted of a number of granules, quite gritty or earthy to the feel.

The edges of the incision were approximated by adhesive plaster ; they did not unite entirely by adhesion, but the part was healed in about a fortnight.

Upon considering the case, it does not appear to me improbable, that in one of the bleedings, of which she had undergone many, or from some similar cause, a branch of a nerve might have been injured. She does not, however, now recollect suffering more particularly at any one time.

Supposing it, however, to have occurred, it seems likely to have given origin to a disordered action in the course of the nerve, in the vessels and parts supplied by the filament, and hence, perhaps, the source of the tumour. This opinion seems to be rendered more probable from the very highly sensible

state of the swelling ; from a nerve being seen entering its substance ; perhaps, also, from the remarkable nature of the contents, which seemed to be to the feel chiefly of an earthy nature ; and from the pain shooting upwards in the arm, in the direction of the nerve, not downwards towards the fingers.

In this case it may be remarked, that the pain did not come on spontaneously in paroxysms, but was, as before observed, always severely excited by any thing touching the part."

A similar case lately fell under our observation. The patient suffered severe pain on the side and near the extremity of one of her fingers ; which however exhibited no external marks of disease. Only a slight induration was perceptible under the skin, but in consequence of her sufferings the patient had resolved to have the finger amputated. It was suggested that by a free division of the nerves and blood-vessels which led to the painful spot, she might expect relief. This was done, and we are informed with complete success.

A Case of Dislocation of the Thigh-Bone. By JAMES CORNISH,
Surgeon, Falmouth.

Dislocations so frequently occur, and so frequently baffle the best directed attempts to effect their reduction, that every circumstance connected with the history of these accidents, that has the least practical value, is worthy of attention. Under this consideration, I beg to relate the following case.

In 1812, — M·Fadder, a seaman, about twenty years of age, coming up from Greenwich to London on the outside of one of the stages, fell from the coach, and injured his hip. He was carried into St. Thomas's Hospital, where his case was treated as fracture of the neck of the thigh-bone. Having, after the lapse of some months, experienced no relief from the means that were adopted, he was discharged, with the assurance that his limb would be useless to him as long as he lived. The man was subsequently taken into Guy's Hospital. Sir Astley Cooper, whose patient he became, thought the head of the femur out of its socket ; and after bleeding him, putting him into the warm bath, and administering nauseating doses of emetic tartar, attempted to replace the dislocated bone. The attempt was unsuccessful, as were also others that were afterwards made, and he was again dismissed as an incurable cripple. In 1813, about twelve months after the accident, the man presented himself on crutches at the Falmouth Dispensary for admission, when he

gave me the foregoing history of his case. On examining him, I found the injured limb about two inches and a half shorter than the other, entirely useless, producing great pain on putting it to the ground, and the knee and foot turned inwards. There was considerable distortion about the joint, and the head of the bone appeared to have formed a socket for itself on the dorsum ilii. In short, he had every diagnostic symptom of the dislocation upwards, which Sir A. Cooper has so accurately marked in his valuable essay on this subject. In consequence of the duration of the accident, and the failure of the attempts at reduction under the skilful management of Sir A. Cooper, his case was considered irremediable, and nothing was done for him. In March, 1818, I met the man walking without the least degree of lameness, carrying a heavy basket on each arm. On satisfying myself that he was the patient I had examined at the Dispensary, and on inquiring into the cause of his cure, he informed me, that in the summer of 1817, five years after the accident, whilst on a passage from Falmouth to Plymouth in a little coasting vessel, the ship made a lurch, which knocked him down. At the moment he fell, he heard a loud crack in his hip; and, from that time, he put aside his crutches, and perfectly recovered the use of his limb. The man is now doing duty as an able seaman on board a ship which trades from this port to London.

The practical importance of this case is not, perhaps, equal to the curiosity of its termination. It shows, however, the possibility of reducing a displaced joint, even after the lapse of years, when every impediment to reduction may be fairly supposed to exist, particularly the obliteration of the acetabulum, and when most surgeons would perhaps judge any attempt hopeless. And it also serves to illustrate, in a very striking manner, the proposition of Sir A. Cooper, that "a slight effort, when the muscles are unprepared, will succeed in reduction of dislocation after violent measures have failed.*" Sir Astley Cooper's diagnostic accuracy in this case is also worthy of remark.—*Repository*.

III. PATHOLOGY AND THERAPEUTICS.

On the most efficacious Means of Remedying the Effects of Opium, when taken in Poisonous Doses. By Mr. Sprague, in the *Lon. Med. Repository*, Aug. 1822.

THE truly distressing catastrophe which lately occasioned the

* Cooper's and Travers' Surgical Essays, vol. 1.

death of the late Bishop of Armagh, by tincture of opium, or laudanum, having been given by mistake for some other medicine, (in which unfortunate case, the united skill of fashionable physicians proved of no benefit to the patient,) has naturally excited much public concern, and induced me, at this time, to earnestly solicit the attention of my professional brethren to what I have found to be the most efficient means of remedying the dangerous effects of opium. This potent, but invaluable, medicine is frequently taken by design, or administered by mistake, as in the instance of his lordship above referred to; and there is every reason to believe that many deaths are occasioned by a failure of the means commonly made use of as antidotes. It must be granted that, whenever we are called to a case where opium has been taken in a poisonous dose, we should, without any delay, make use of the most powerful measures to counteract its deleterious influence. The materia medica furnishes us with many efficacious remedies, which, if timely administered, will generally prove successful; but, to produce so desirable a result, they must be given in proper doses, and promptly and energetically applied. We are informed by authors, that "the first thing to be done is to endeavour to evacuate the contents of the stomach by active emetics;" but, in such cases, that organ is rendered so insensible to stimuli, that all the emetics commonly advised to be given, such as sulphate of zinc, or copper, antimonial tartar, &c. frequently fail to produce vomiting, as must have been witnessed on many mournful occasions. The following is more to be depended on, and will seldom disappoint the anxious desire of the practitioner, in rousing the action of the stomach;

R Ammoniaë Subcarbonatis, ʒj.

Pulv. Rad. Ipecac. ʒss.

Aqua Menthæ Pip. ʒiij.

Tinctura Capsici, ʒij.

M.

ft. Haustus emeticus, quamprimum adhibendus.

If the patient has lost the power of deglutition, the draught should be introduced into the stomach by means of a flexible hollow tube, or a large-sized gum-elastic catheter. Next, let a little of the liquor ammoniaë be taken on a feather, and put up the patient's nostrils; and a piece of folded linen, wetted with the same, laid over the region of the stomach, which sometimes raises an instantaneous blister, and always proves useful. A single drop of the liquor vol. cornu cervi (being less caustic than the liquor ammoniaë,) should be cautiously dropped into the external canthus of the eye, which, by being diffused over the globe, by the action of the orbicularis palpebrarum muscle,

has the most beneficial effects. The patient's head should be kept in the most erect position, and folded cloths, dipped in the coldest water, constantly applied to it; whilst the lower extremities are to be immersed in water of as high a temperature as can be borne.* A sufficient time having elapsed after the emetic has been given, its operation should be promoted by giving a quart of warm water, in which has been mixed two teaspoonsful of flour of mustard."

After vomiting has been excited, the patient is to drink freely of a strong decoction of coffee. Lemon juice is to be given in half ounce doses, and repeated every half hour; and an enema of oil of turpentine is to be administered with all possible despatch.—Should exhaustion or costiveness supervene, the former is to be remedied by ammonia and other stimulants; and the latter by the infusion or tincture of Senna. In order to restore the energies of the system the shower-bath is to be used every morning for a fortnight. The following cases by Mr. Wray† illustrate the decided efficacy of cold affusion in the treatment of poisoning from opium.

Case 1.—I was called, early in January, 1821, to Mrs. E——, who had, half an hour before, taken about two ounces of laudanum. I found her in bed, in a state of profound stupor. Her pulse was much quicker than natural,—her pupils were dilated. Every means which could be suggested at the time were employed to rouse her from her lethargy, but without effect. Under such circumstances, no internal remedies could be administered. I afterwards had recourse to cold affusion, which produced the most decided benefit. A large bucketful of cold spring-water was brought into the room, and a quart basinful was forcibly thrown on the head and chest. It roused her on the first application, but immediately afterwards she relapsed into the same state of stupor. By resorting repeatedly to the same means, in about ten minutes, I had the satisfaction of hearing her speak. An emetic was then administered, which operated freely. Vinegar and water were given afterwards, and on the least tendency to drowsiness the cold affusion was repeated. I had the gratification, the following day, of seeing this lady perfectly restored.

* Mr. COLLIER, of Norfolk-street, in the Strand, has lately communicated to the profession a mode which he proposes for effectually rousing the system in cases of poisoning by narcotics. His method consists in scattering some of the pubis dolichi prurientis over the body of the patient, particularly about the head, neck, and arms. The effect is said to be almost immediate.—*London Medical and Physical Journal*, for March 1822.

† *Medical Repository*, July, 1822.

Case 2.—April 17, 1821. A gentleman, residing in the vicinity of Chancery Lane, took two ounces and a half of laudanum, in a fit of desperation, on account of some losses he had sustained. Immediately after taking it he became sensible of his folly, and informed the waiter of the coffee-house where he was at the time, of the circumstance, who immediately sent for a medical gentleman. An emetic was instantly administered, and, after its slight operation, he was put into a hackney-coach and driven to Fleet Street, where he had given his address. The coachman, on opening the door, found him lying at the bottom of the coach, in a state of perfect stupor, from which he could not be roused. He was taken in this state to the watch-house, where he was recognised, and thence conveyed to his own house, when another medical man and myself were sent for. That gentleman having arrived some time before me, had employed the usual means, in order to rouse him from the state of coma into which he had sunk. Every attempt produced merely a momentary effect ; when left alone, he dropt into his former condition. As soon as I arrived, I requested that the cold affusion to the head and chest might be tried. A few applications of it, in a similar manner as in the former case, had the effect of removing completely the profound stupor, and the other alarming symptoms which were present. He complained, the following day, of head-ach and soreness in the epigastric region : the former arising, most probably, from the effects of the opium on the nervous system ; the latter from the irritation induced by the strong emetics administered in order to produce full vomiting. These symptoms soon yielded to bleeding and other antiphlogistic means.

CASE 3.—On the night of May 12, 1822, I was called to Mrs. W—, Whitefriars, an extremely delicate young woman, about twenty-five years of age, who, at half-past ten, had taken two ounces of laudanum, with the intention of destroying herself. Having been at that time particularly engaged, I sent my assistant, with directions to employ the cold affusion, and to administer an emetic as soon as deglutition might be accomplished. If the symptoms were very alarming, he was also instructed to send for me. Immediately after his arrival, I was again sent for, at his request. On entering the room, he acquainted me that he had considered it too late to do any thing, and therefore had not attempted it. She appeared, in fact, when I arrived, nearly dead. During the preparation for the cold affusion, I endeavoured to rouse her by various external means of irritation, but with no effect. The pupils were dilated, and quite insensible to the light from a candle that was presented close to

them. The pulse could occasionally be felt in slight undulations, and the body possessed a considerable degree of warmth. The head and chest were raised, and I began by throwing a large basin-ful of cold water forcibly on the head, which produced an evident twitching in the muscles of the face. By repeating these means, at intervals of some seconds only, she uttered a lamentable scream, much resembling that of a person recovering from suspended animation by immersion. After a few more applications of the affusion, a very strong emetic was administered, with considerable difficulty ; but it was no sooner taken than she relapsed into the same state of inanimation, from which she was only restored by the frequent and forcible dashing of the cold water on the head and chest. She was afterwards raised from the bed, and carried up and down the room between two persons, with nothing on but a chemise ; and, by the repeated employment of the affusion, she might be said to have been in a continued shower-bath. In about half an hour from the exhibition of the emetic, it began to operate slightly. The ejected matters smelt strongly of laudanum. The vomiting was promoted by warm water and an additional emetic.—After the stomach had been emptied, vinegar and water were freely administered. Notwithstanding these means had been used, she frequently relapsed into a state of syncope, from which she could only be roused by a fresh affusion. In about three hours from the commencement of the treatment, the pulse acquired greater force, and her appearance altogether showed an evident return of the powers of life. By constant attention, during six hours, to the means already employed, whenever they appeared requisite, I had the satisfaction to see her sufficiently restored to allow her, with perfect safety, a few hours of repose. She only suffered a little from debility, during two or three days.

In a similar case Dr. Copeland has employed the same remedies with success—but instead of collecting additional evidence respecting the efficacy of cold affusion, we would call the attention of our readers to another resource equally prompt and efficacious.

“THE common occurrence of death from opium, either when taken by accident or design, shows that we have hitherto not been acquainted with any certain means of ejecting it from the stomach, or of counteracting its effect. I have constructed an instrument that might, perhaps, properly enough, be called the *gastric exhaustor* : it is not meant to supersede the use of emetics and other medicines, though I am of opinion it may, in

many cases, render their use less necessary than formerly. The instrument consists of a common syringe, with a flexible tube fitted to it, of length sufficient to allow one end to enter the stomach : it may be formed of leather, or of the same materials as the elastic flexible bougie, (the same syringe should have these tubes of different sizes, to suit the various subjects who might require their use ;) the ordinary circumference of it would be from an inch to an inch and a half ; the point destined to enter the stomach should be smooth and furnished with holes, like the catheter : these holes should be four, or six, in number, and as large as the tube will admit of. By attention to this part of its construction, even the more solid, as well as the fluid, contents of the stomach will be brought from it, when the piston is made to act. The syringe and the tube should not be permanently fixed, but so constructed that they can be put together and separated instantaneously ; and a flexible rod of whalebone should accompany the tube, to give firmness to it in entering the stomach, but should be withdrawn before the syringe is fixed.

I will add a few remarks on the mode of using this instrument. If called to a person who had swallowed opium, I would introduce the tube of the exhauster into the stomach ; having half-filled the syringe (which should at least be capable of containing a pint,) with warm water, I would fix it to the tube, and, in the most gentle manner, force it into the stomach ; then, with the same caution, by drawing back the piston, fill the syringe with the contents of the stomach, and, by separating the syringe from the tube, discharge it. I would then fill the syringe partially as before, and repeat the process above described ; and so again and again, till the water was returned unmixed with the poison. The patient might be in the sitting position on the introduction of the tube, but lying on the left side might be a better one, when the injection and exhaustion is to be performed. The introduction of the water would seem a necessary precaution, to prevent ill effects from the action of the exhauster on a comparatively empty stomach.

This operation, if conducted with the least address, might be commenced and finished in three minutes ; and all the danger from the retention of the poison in the stomach, which takes place when emetics are relied on, avoided."—*Med. and Phys. Journal*, Sept. 1822.

The practicability of evacuating the stomach by a syringe and flexible tube, will not be called in question by American surgeons, since it was performed by Dr. Physic many years ago, and has probably been demonstrated to the Medical classes in the university of

Pennsylvania ever since. Certain we are that it has been performed repeatedly in the United States, and unless we mistake, the original inventor has published the mode and the success of the operation.

IV. MATERIA MEDICA AND PHARMACY.

CROTON TIGLIUM. LIN.

Purging Croton.

This article has lately attracted considerable attention among the British Physicians. The medical botanist will immediately recognize from its name, that it belongs to the genus which includes the tree that produces the officinal cascarilla, that upon which the resin commonly called Lac, is found, the Balsam tree of the West Indies, and the plant which affords the colouring juice called Tournesol. The Tallow tree of China, now cultivated in the United States, is by some associated with the same genus, by others it is considered distinct. Five species of *Croton*, out of eighty-three, belong to North America, one of which is said to be highly aromatic. The immediate subject of these remarks is a small tree which commonly rises to about the height of ten feet, and is found in Ceylon, Malabar, China, Cochinchina and the Moluccas. The seeds (being the part at present employed in medicine,) are of the size of a small bean, convex on one side, somewhat concave on the other, covered on the outside with a thin brittle shell, varying in colour from light yellow to brown. The kernel is white, its taste is at first mild and pleasant, but after remaining a few moments in the mouth, it is intensely acrid and burning. This kernel consists of 27 parts of an acrid, resinous, purgative principle, soluble in alcohol, sulphuric æther, and fixed-oils; 33 of a fixed-oil not miscible with water, but combining with alkalies and forming a saponaceous mass, without acrimony or medicinal activity; and 40 of farinaceous matter.

The kernel of the seed in substance, the expressed oil, which thus obtained holds much of the acrid principle in solution, and the alcoholic tincture, constitute one of the most speedy, powerful, and certain cathartics hitherto known. A single grain, about one third of a kernel, or a drop of the expressed oil, taken without modification, usually produces powerful catharsis, commonly in a space from half an hour to three hours. Its vehemence of operation may be equalized and corrected, without lessening its certainty, by aromatics, particularly the essential oils, such as cinnamon and cloves, by the vegetable acids, as the Tartaric and Citric, by Catechu and other astringent extracts of the same nature, or by a small quantity of opium.

Roasting or baking the seeds previous to expressing the oil, is said to answer the same purpose; but as heat probably impairs the cathartic power, in a degree varying with the temperature, this cannot be the most eligible method.

The manner in which this article operates, is hydragogue and drastic, and similar to *Elaterium*, the oil of the shells of the seed of *Ricinus-communis*, and the seeds of *Jatropha-Curcas* and *multifida*. It is said not to produce tormina oftener than in one case in ten, nor nausea nor vomiting in more than one case in twenty or thirty, which is not more frequent than happens from efficient doses of the most common cathartics. When the oil is used, it may be taken floating upon some aromatic distilled water, or upon wine, or diluted spirit of some sort, or in the form of mixture, with aromatics, sugar, and mucilage. When there is no peculiar irritability of stomach, it is probable that dilution with one or two ounces of some appropriate liquid, might render its operation more pleasant. It may likewise be taken in the form of pill, in combination with almost any substance of suitable consistence.

This oil has been usefully employed in some cases of mania, apoplexy and paralysis. It has proved efficacious in the removal of water in dropsy, it has relieved oppressive corpulency, brought away *Tenia*, and in combination with opium been serviceable in Neuralgia, and *Delirium-tremens*.

Were the value of cathartics to be measured exclusively by the smallness of the necessary dose, the facility of administration, the certainty, *speed*, degree, and general pleasantness of their operation, this article would doubtless be entitled to a very high rank in the catalogue, and would deserve to supersede the greatest proportion of those now in common use; but it is an undoubted fact, that in most cases, all these considerations are but of secondary importance in the selection of a purgative, the specific impression made upon the alimentary canal, and through its medium, upon the system generally, being of vastly the most consequence. It is not therefore to be expected, that this, or any other article, can ever be preferable, at the access of typhoid febrile diseases, to the *slow and moderate* effect of pure Calomel, administered in small and regularly repeated doses, till it operates; or that in actively inflammatory diseases, it can be useful, as brisk and free purging, with neutral salts, aided if necessary, by a suitable quantity of Tartrate of Antimony; or that in dropsy, it can be better than *Elaterium*.

It would however be without a parallel, if this article should not be found to possess some peculiarity of effect, by which it

may be more especially useful in some particular cases. If this should never prove to be the fact, a remedy operating in such small quantities, and capable of being administered in so many convenient forms, must prove of great importance as an auxiliary to other cathartics. In cases of irritable stomach, how often are we greatly embarrassed by the bulk and the offensiveness of the necessary form, and the nauseous taste of the common purgatives; this article would seem to be singularly adapted to the removal of obstinate constipation, as well as all those low cases of colic, in which there is difficulty in retaining medicine on the stomach. Perhaps by diminution of dose, and suitable repetition, and by qualification in some other way, it may become useful, as a certain, effectual, and yet moderate laxative.

It is said to be contraindicated in all cases in which "*inflammatory action is going on*," and as evidence upon this point, a case of rheumatism is mentioned, in which its use was followed by retrocession of the disease to a vital organ, which caused death in three days. We are inclined however to draw a conclusion from this case, very different from that drawn by its reporter, and to consider it as much more probable, that the cathartic produced the catastrophe, in the same manner as drastic purging with neutral salts, sometimes produces a similar effect in gout, which by no means proves, that salts are improper in genuine cases of active inflammation.

The oil of purging croton in the market, is said already, to be much adulterated with other fixed oils. When it is pure, it produces on external application rubefacient effects, and when applied to the tip of the fingers, it is said to occasion a sense of numbness in the fingers, hand, and arm, thirst and dryness of the throat, and headache, which often continue for several hours. If rubbed on the umbilical region, it is said to be capable of purging.

As respects the most eligible form of exhibition, it is to be remarked, that in substance, it can hardly be in a state of sufficiently minute division, to operate bindly. The oil, in doses of half or whole minum, in some suitable vehicle, is sufficiently convenient and active, but will probably always be so liable to adulteration, as to be uncertain. The tincture therefore, prepared directly from the seeds, would seem to be preferable to any other method, as its strength is capable of being uniform, and as it allows an equable diffusion of the medicine over the coats of the stomach. For this, there is, as yet, no standard formula. Dr. Bigelow, of Boston, recommends the proportion of five scruples of the bruised kernels, to a pint of alcohol, which he directs to be carefully triturated, and after ten

days digestion, to be filtered. The dose of this he says is about a fluid drachm. We can see no objection to its being made still stronger, if practicable, so that even a few minims may be a sufficient dose.

The recent wood of the Purging-Croton, is said to possess a pungent and almost caustic taste, and in the dose of a scruple or half a drachm, operates violently as a cathartic. In its dry state, a much larger quantity is required, to produce the same effect. In smaller doses, it is considered a good diaphoretic. The leaves are said likewise to possess the same purgative properties. They have been recommended as an external application, in cases of the bites of venomous reptiles.

Farr on the Fucus Helminthocorton.

The fucus helminthocorton, which grows abundantly on the shores of Corsica, and has thence by the French been called *Mousse de Corse*, is frequently used on the Continent as a vermifuge. Buonaparte, whose mind was alive and attentive to all that passed within the sphere of his observation, had remarked, during the exhibition of this medicine in cases of worms, that tumours were gradually dispersed; and in a conversation with Mr. O'Meara, expressed his surprise that it had never been tried for this purpose by the Profession. The remark was mentioned by Mr. O'Meara to Mr. Farr, who had previously been trying some of the British fuci in the treatment of tumours. Mr. Farr immediately sent to the Continent for a supply of the medicine; and has, he says, succeeded with it beyond his most sanguine expectations, in the reduction of scirrhus tumours. His practice, however, has as yet been too limited, we think, to justify us in being as sanguine as he is, respecting this medicine; but it is at all events worthy of a cautious trial, in cases where other medicines have failed. We say *cautious*, as its effects seem to be rather of a violent kind; for he speaks of nausea, vertigo, and a *bearing down of the rectum* accompanying its use, and as nothing but what may be usually expected.

The helminthocorton, according to Mr. Farr, is best given in infusion or decoction, beginning in the proportion of half an ounce to a pint of boiling water—a wineglassful to be taken thrice a day; and increasing or diminishing the dose according to the effects produced. In some cases where the bowels are not sufficiently acted upon, he combines it with rhubarb, or some other aperient.—*Lon. Med. Rep. Feb. 1822.*

UNITED STATES.

Six quarterly Journals are now published in the United States, having for their object, the extension and improvement of medical knowledge. They are too respectable to require any eulogium from us, and we have no disposition to hazard any invidious remarks respecting their comparative merits. By an eminent cotemporary writer it has been observed, and the observation is as true in this country as in England, that there is no species of medical literature, which more requires the healthful process of candid commentary than this, and none which has so generally escaped it. To such of our readers as are engaged in the discharge of professional duties, we offer a concise sketch of whatever is interesting, novel or important in the American Journals, with occasional remarks upon the execution and merits of individual papers.

The Philadelphia Journal of the Medical and Physical Sciences,
VOL. V. NO. IX.—NOV. 1822.

BY N. CHAPMAN. M. D.

ART. 1. *On the sick head-ache*, by JAMES MEASE, M. D.
This is, unquestionably, a gastric affection arising from the ordinary causes of indigestion, and requiring for its cure the same remedies, and the same diligent attention to diet and regimen. Dr. Mease commences the treatment by a laxative of Rhubarb, combined either with soap or calomel, sometimes by an emetic, to be succeeded, for several weeks, by a combination of iron, colombo and orange peel. Fowler's solution is confidently recommended to be taken early in the morning in doses of eight or ten drops. To a person accustomed to prescribe for dyspepsia it would be superfluous to repeat what Dr. Mease has written on the subject of *diet*. The bread must be stale, the meats digestible, well cooked, well masticated, and taken in moderate quantities, the drink pure water, or occasionally combined with the alkaline carbonates, and in all cases used sparingly. Exercise in the open air is deemed indispensable, change of air beneficial, fatigue and mental irritation injurious.

When the disease announces its approach by the usual premonitory symptoms, our first attention should be directed to the stomach; bile is to be removed by an emetic of Ipecacuanha, and acid by magnesia or the alkaline carbonates; after which a few drops of laudanum are to be taken, and sleep encouraged by retiring to bed in a dark room.

ART. II. *An account of an Epidemic Fever which has prevailed in certain parts of Virginia for the last eight years.* By JNO. L. MILLER, M. D. of Brunswick, Va.

This fever is said to have first appeared in 1814 when it was ushered in with a chill, which was succeeded by acute pain in the thorax: the head was frequently affected with pain, and the throat with swelling so sudden and severe as to interrupt respiration. The pulse was strong, hard and tense, sometimes slow and depressed. The skin dry and hot, the tongue foul and parched. In some instances there were cough and bloody expectoration, and in all cases discharges of large quantities of bile. These cases were treated by copious bleeding, repeated as often as the pulse seemed to require, by antimonial emetics, by calomel, to excite ptyalism, by diaphoretics and blisters.

This disease continued until 1819, when it assumed a different form, and required a very different treatment. Lassitude, chilliness, or a severe ague, succeeded by acute pain in the head, breast and side, and occasionally cough, and bloody expectoration, accompanied by a large, full, soft, and compressible pulse, were the symptoms of the latter disease. Unless checked by appropriate remedies, these were soon succeeded by the symptoms of typhus fever, such as coma, delirium, weak and faltering pulse, cold clammy sweats, blackness of the tongue, and fauces, subsultus tendinum, &c.

The treatment was herculean. In one case the patient took 70 grains of Tartar emetic at a dose. In all cases this remedy was prescribed, and frequently repeated, succeeded by calomel, expectorants, and blisters. In the more advanced stages, cinchona, and diffusible stimulants were given freely, warm water, and the actual cautery were used as excitants. Much reliance was placed on toddy, in which form, a gallon of brandy or whiskey is said to have been given in 24 hours with the happiest effects. We regret that Dr. Miller has not traced more particularly the progress of this epidemic, from year to year, and from one form to another, we should like to know if the transition was gradual or abrupt.

ART. III. *Observations on the Secale Cornutum, or Ergot—with Directions for its use in Parturition.* By JOHN STEARNS, M. D.

From the author of this essay, we first derived our knowledge of the ergot. In consequence of his letter to Dr. Akerly, published in 1807, it was soon introduced into general use, and is at this time very extensively employed by the physicians of the United States. The circumstances which should restrain the use of this remedy, have been enumerated by Dr. Stearns, in the 7th volume of the New-England Journal. In this essay,

he has noticed the indications which render its exhibition necessary and important.

The ergot is indicated, and may be administered, when the soft parts are relaxed, and the pains ineffectual—when in the early stages of pregnancy abortion becomes inevitable—when the placenta is retained from a deficiency of contraction—in patients liable to hemorrhage immediately after delivery, in puerperal convulsions—and when after delivery the uterus continues relaxed without any ability to contract.

ART. IV. *Extracts from Magendie's Formulæ, for the Preparation and use of several new Medicines. Translated from the French.* By WILLIAM DARRACH, M. D.

This being an unfinished article, will detain us but a moment. It is impossible to foresee what effect the improvements in chemical analysis will have on the *Materia Medica*. Within a few years, Opium, Ipecacuanha, Cinchona, Senna, and several other medicinal agents have been analysed, the principles in which their respective virtues reside, have been separated from those which are noxious or useless, new and convenient formulæ have been proposed, and greater precision obtained in the administration of valuable remedies. The present paper contains observations on the subjects of morphia, and narcotine from opium; emetin from ipecacuanha; quinine and cinchonine from the different species of cinchona; with rules for their preparation and prescription.

ART. V. *Remarks on a Disease resembling Syphilis.* By MOSES QUARLES, M. D. of South Carolina.

"In this disease, instead of a chancre, there is a discharge from the urethra and glans penis—there are no buboes—the eruption disappears without the use of mercury, and returns at uncertain intervals, and for an indefinite number of times—neither is there ulceration of throat, nor nodes, nor caries of the bones: and the pains, instead of following the course of the long bones, are confined to the large joints."

Four cases are reported, in which medicines were employed several months without much advantage, and at last abandoned, after which the patients got well.

ART. VI. *Experiments and Reflections on the cause of the Vacuity of the Arteries after Death.* By WILLIAM FENNEL, M. D. of Virginia.

The experiments of Dr. Carson on this subject are generally known, as well as his conclusions, "that the difference of the distribution of the blood after death, from that in which it must have existed in the living system, arises chiefly from the elastic

power of the lungs, and that the emptiness of the arteries and of the smaller vessels observed after death, admits of a satisfactory explanation, from the supposed operation of this cause, combined with that of the elasticity of the arterial canals."

We give the explanation of Dr. Fennel in his own words.

"In reviewing my own experiments, I am led to draw from them an explanation of the problem before us, which I shall now with great diffidence submit.

"That respiration ceases previously to the entire cessation of the action of the heart and arteries, in animals which are killed or die a natural death, is a fact that every one must acknowledge. This being the case, when respiration ceases, the lungs become flaccid, and thus occasion a partial obstruction in the weakened circulation. But the heart and arteries continuing to act sufficiently to empty themselves of the blood imposed upon them, forcing it into the veins, which tubes being less powerful than the arteries, and having the obstruction in the lungs to oppose the passage of blood from the right to the left side of the heart, they unavoidably become the part of the circulatory system, which must contain the great mass of the blood after death."

ART. VII. *An Essay on Uterine Hemorrhage.* By WILLIAM P. DEWEES, M. D.

This essay being unfinished will be noticed in a subsequent number of our Journal.

ART. VIII. *Notice of some further Physiological Experiments.*

By J. O. B. LAWRENCE, M. D. and B. H. COATES, M. D.

In the former numbers of the Philadelphia Journal, we have read with interest the accounts of physiological experiments, performed by Drs. Lawrence and Coates. From this paper we learn that they have repeated with the same results, the experiments of Magendie, "in which he succeeded in producing the specific effects of nux vomica, on the general system, by introducing that article into a wound in a limb, when the only connexion with the body was by means of two currents of blood flowing through quills." They have also repeated the experiments of Professor Mayer on absorption from the lungs, and with results similar to his.

ART. IX. *A Case of Traumatic Tetanus, successfully treated.*

By ROBERT MURPHY, M. D.

"A strange sort of jerking" about the back of his neck and along the course of the spine, with pain about the extremity of the sternum, and spasm whenever the patient attempted to speak or move, are the only symptoms of traumatic tetanus which the writer has seen fit to record. The remedies were

laudanum and rum, both increased till the former amounted to 600 drops and the latter to a quart in twenty-four hours.

ART. X. *A Case of Fracture of the Bone of the under Jaw, successfully treated by Dr. Physick, with a Seton.*

The employment of a seton, as a remedy for artificial joints, appears not to have been so successful in Europe as in this country, and we observed with regret in some late publication, a disposition to abandon it. The present paper furnishes additional evidence of its utility; the motion of the artificial joint being suspended in the course of the eleventh week from the introduction of the seton.

ART. XI. *Cases illustrative of the efficacy of Charcoal, in obstinate Constipation of the Bowels, with remarks, &c. by WILLIAM C. DANIELL, M. D. of Savannah.*

In a case of obstinate constipation, after the failure of other remedies, a table spoonful of charcoal was given every half hour, and continued seventeen hours, when the bowels were moved.

Dr. Daniell has employed the same remedy in fourteen other cases with success. It has a happy influence in lulling the irritability of the stomach, when nothing else would control the nausea and vomiting of the patient, thus fulfilling the double intention of first relieving a very distressing symptom, and then removing the disease itself.

ART. XII. *A Case in which some distressing symptoms were induced, by a large Coagulum of Milk long retained in the Stomach, by Dr. PHILIP TYDIMAN.*

Pain in the left hypocondrium, oppression and soreness of the stomach, nausea, cardialgia, palpitation of the heart, accompanied by a full, hard, and occasionally intermitting pulse, were the prominent symptoms of this singular case. The remedies were an emetic, venesection repeated six or eight times, saline cathartics, absorbents, calomel in alterative doses, blisters and diaphoretics. These were succeeded by cinchona, columbo and wine, by which the patient's strength was recruited and he enabled to resume his former occupation. Five months after the attack he was seized with a chilly fit, accompanied by excessive nausea, and in a few minutes with the utmost pain and difficulty he brought up a large smooth coagulum, which was an inch and a half in thickness, and five or six inches in length. From that time he regained his health.

ART. XIII. *A Case of Ruptured Uterus, read before the "Pittsburgh Medical Society," July 2d, 1822, and communicated to the Editor. By Dr. WM. CHURCH, of Pittsburgh.*

In this case, when Dr. Church was called, the child's head

was wedged in the pelvis, and its elbow could be felt through the parietes of the abdomen, which had lost its globular form. As no other than the above symptoms of ruptured uterus had occurred, the patient was bled, and two drams of ergot were administered without effect. After several unsuccessful attempts to disengage the head of the child it suddenly receded. Hemorrhage occurred, followed by syncope, and in a few hours by death. Upon examination, the uterus was lacerated from the fundus to its connexion with the neck of the bladder, and its parietes were reduced from the ordinary thickness to that of paper. The placenta was disengaged, and every part of the child had escaped from the uterus. The bladder was preternaturally large, its texture hard and firm as the most indurated glands, and its parietes more than two inches in thickness.

ART XIV. *Case of Rupture and Inversion of the Uterus of a Cow.* From Godman's Western Quarterly Reporter.

In this case the uterus was inverted, and had a long rupture extending obliquely across the fundus. After several strenuous attempts, it was at last returned without much attention to the order in which it was reduced, and at the expiration of six weeks the animal was reported to be perfectly well.

REVIEWS.

ART. XV. *On the Uses of the Spleen.* By THOMAS HODGKIN. The Edinburgh Medical and Surgical Journal, No. LXX. January, 1822.

The physiological speculations of Dr. Rush, respecting the uses of the spleen, are well known on this side of the Atlantic. Without mentioning the name of our distinguished countryman, Mr. Hodgkin has adopted the same opinions, and the main object of the review is to establish the claims of Dr. Rush, in opposition to the new theory which has lately been defended in the Edinburgh Medical and Surgical Journal.

ART. XVI. *Reflexions Medicales sur la Maladie Spasmodico-Lipyrrienne des Pays Chauds, vulgairement appelee Fievre Jaune.* Par J. L. CHABERT, D. M. M., &c. Nouvelle Orleans, 1821.

A review like the present is incapable of abridgment, and we can only refer our readers, who feel particularly interested in this subject, to the Journal which contains it. We would also refer them to the same work, for two interesting biographical sketches, which our limits will not permit us to transcribe. One is an eulogium on Dr. William Shippen, delivered before the College of Physicians of Philadelphia, by the late Dr. Wistar; the other an obituary notice of Edward Barton, M. D.

VARIETY.

Removal of Diseased Ovarium.—This operation has been recommended in Germany, and we believe recently in this country. It has been once performed successfully in America. There are, however, many considerations which appear to forbid its adoption. 1. The operation can only be performed, successfully at least, before the ovarium has reached the more advanced stages of disorder, and before it has formed adhesions, &c. 2. Ovarian disease is not always a fatal malady; it may be kept in check for many years, and may ultimately disappear, under judicious treatment and regimen, during its earlier stages. 3. As there is but little prospect of success from the operation when the disease has advanced; and as the disorder, at the period in which an operation is most likely to be successful, may be removed by medicinal means, the two chief reasons in favour of so formidable an undertaking do not exist. We do not, however, maintain, that peculiar circumstances of disease of the ovarium, the state of the patient, &c. shall always render the operation unnecessary; but such exceptions to the general conclusion which we have formed, can be few indeed, and but seldom occur. The propositions on which this inference is formed, we will support on another occasion.—*Lon. Med. Rep.*

Operation for cleft Palate.—Roux has lately succeeded in removing this deformity in a young man, who had a natural division of the velum pendulum to so great an extent as to almost entirely deprive him of the power of articulation. By means of an ingenious operation, resembling that for hare-lip, M. Roux was enabled to bring the flap together, and procure their union in a favourable manner. He has already practised the operation, with similar success, in another case.—*Lon. Med. and Phys. Journal.*

Large Human Calculus.—A large human calculus has been described by Prof. CUMMING, of Cambridge: it weighs 32 ounces, and measures 15 1-2 inches in circumference. Its specific gravity is 1.756. The nucleus is lithic acid, and to this succeeds a considerable portion of the oxalate of lime, then layers of the triple phosphate, covered by a thick coating of lithic acid, the external surface being composed principally of the fusible calculus. It is in the possession of Trinity College. A calculus is also noticed from the intestines of a hare: it is composed of vegetable matter and the phosphates.—*Journal of Sciences.*